

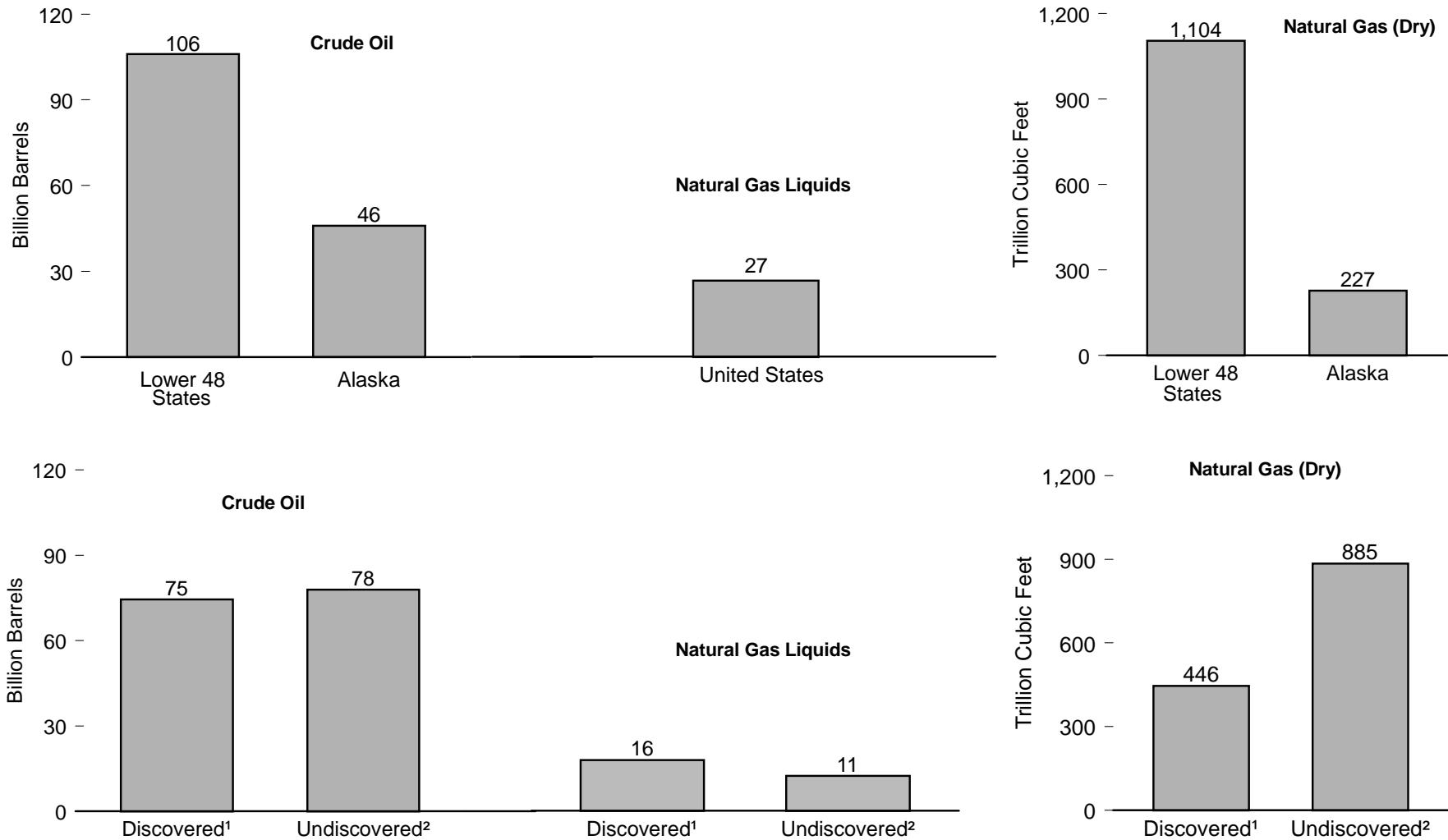
4

Energy Resources



Semisubmersible drilling rig in the Gulf of Mexico. Source: U.S. Department of Energy.

Figure 4.1 Technically Recoverable Petroleum Resource Estimates, January 1, 1999



¹ Excludes "proved reserves," which are more certain than the resource estimates shown in this figure.

² Undiscovered, technically recoverable resources.

Source: Table 4.1.

Table 4.1 Technically Recoverable Petroleum Resource Estimates, January 1, 1999

Region	Crude Oil ¹ (million barrels)			Natural Gas Liquids (million barrels)			Natural Gas (Dry) (billion cubic feet)		
	Alaska	Lower 48 States	United States	Alaska	Lower 48 States	United States	Alaska	Lower 48 States	United States
Discovered ²									
Reserve Growth (Conventional; Onshore)	313,000	447,000	60,000	500	12,900	13,400	32,000	290,000	322,000
Reserve Growth (Conventional; Federal Offshore)	0	⁵ 2,238	2,238	NE	NE	NE	0	⁵ 32,719	32,719
Unproved Reserves (Conventional; Onshore)	NA	10,256	10,256	NA	2,273	2,273	NA	86,395	86,395
Unproved Reserves (Federal Offshore)	400	1,643	2,043	NE	NE	NE	700	4,436	5,136
Undiscovered, Technically Recoverable ²									
Conventional (Onshore)	8,440	21,810	30,250	1,120	6,080	7,200	68,410	190,280	258,690
Conventional (Federal Offshore)	24,300	21,300	45,600	⁶ ()	1,800	1,800	125,900	142,100	268,000
Continuous-type (in Sandstone, Shales and Chalks; Onshore)	NE	2,066	2,066	NE	2,119	2,119	NE	308,080	308,080
Continuous-type (in Coal Beds; Onshore)	NA	NA	NA	NA	NA	NA	NE	49,910	49,910
Total	46,140	106,313	152,453	NA	NA	26,792	227,010	1,103,920	1,330,930

¹ Condensate is included with crude oil for Minerals Management Service (MMS) estimates in Federal Offshore regions.

² Excludes "proved reserves," which are more certain than the resource estimates shown in this table.

³ Using U.S. Geological Survey (USGS) definition, 952 million barrels of indicated additional oil reserves were included (Energy Information Administration (EIA), year end 1996).

⁴ Using USGS definition, 1,924 million barrels of indicated additional oil reserves were included (EIA, year end 1996)

⁵ Reserve growth in the Pacific Federal offshore is not included. It was not estimated by MMS.

⁶ Alaska is included in Lower 48 States.

NA=Not available. NE= Not estimated.

Notes: • See Note 1 at end of section. • The category Unproved Reserves (Conventional; Onshore) is the result of low oil prices that caused temporary de-booking of formerly proved reserves in 1998.

• Onshore indicates estimates for all Onshore plus State Offshore waters (near-shore, shallow-water areas under State jurisdiction). • Federal Offshore denotes MMS estimates for Federal Offshore jurisdictions (the

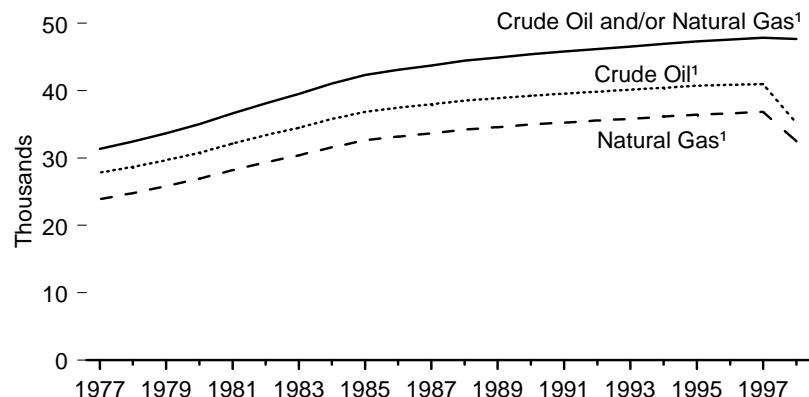
Outer Continental Shelf and deeper water areas seaward of the State Offshore jurisdictional boundary).

• The USGS mean estimates are as of year-end 1993 (onshore and State offshore). The MMS mean estimates are as of year-end 1994. Probable and possible reserves are considered by the USGS to be part of reserve growth but are separately estimated by MMS as unproved reserves. USGS did not set a time limit for the duration of reserves growth; MMS set the year 2020 as the time limit in its estimates of reserve growth in existing fields in the Gulf of Mexico. Excluded from these resource estimates are undiscovered oil resources in tar deposits and oil shales, and undiscovered gas resources in geopressured brines and gas hydrates. • Data may not sum to totals due to independent rounding.

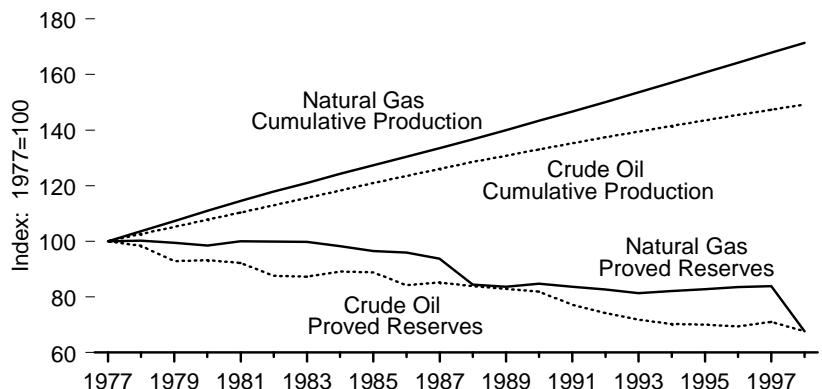
Sources: **Federal Offshore:** U.S. Department of the Interior, Minerals Management Service. *An Assessment of the Undiscovered Hydrocarbon Potential of the Nation's Outer Continental Shelf* (1996), OCS Report MMS 96-0034. **Onshore:** U.S. Department of the Interior, U.S. Geological Survey (USGS), *1995 National Assessment of United States Oil and Gas Resources*, USGS Circular 1118. **Unproved Reserves (Conventional; Onshore):** Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report 1998* (December 1999), Table G1.

Figure 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, 1977-1998

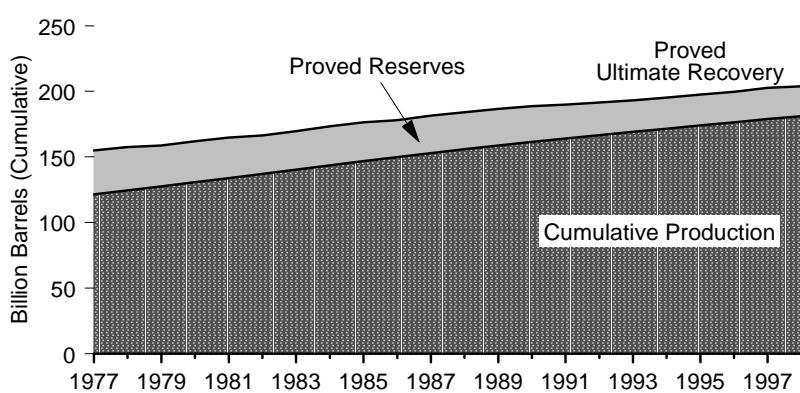
Cumulative Number of Fields



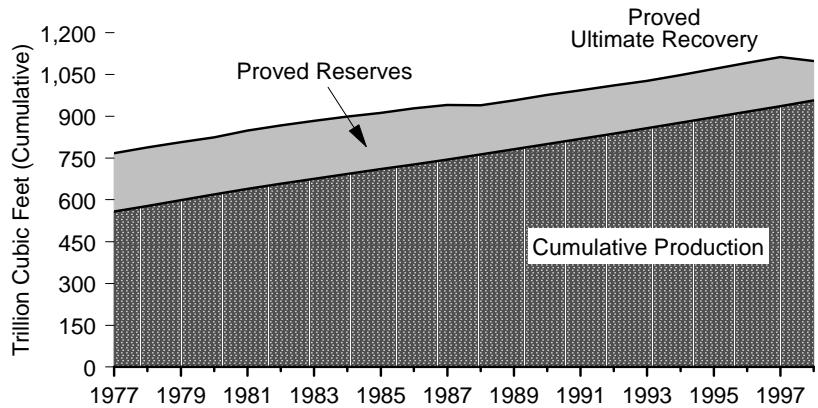
Cumulative Production and Proved Reserves, Indexed to 1977



Crude Oil



Natural Gas



¹ There is a discontinuity in this time series between 1997 and 1998 due to the absence of updates for a subset of the data used in the past.

Notes: • Data are at end of year. • Crude oil includes lease condensate. • Natural gas is wet, after lease separation.

Source: Table 4.2.

Table 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, 1977-1998

Year	Cumulative Number of Fields with Crude Oil and/or Natural Gas	Cumulative Number of Fields with Crude Oil	Crude Oil and Lease Condensate (billion barrels)			Cumulative Number of Fields with Natural Gas	Natural Gas ¹ (trillion cubic feet)		
			Cumulative Production	Proved Reserves	Proved Ultimate Recovery		Cumulative Production	Proved Reserves	Proved Ultimate Recovery
1977	31,360	27,835	121.4	33.6	155.0	23,883	558.3	209.5	767.8
1978	32,430	28,683	124.6	33.1	157.6	24,786	578.4	210.1	788.5
1979	33,644	29,671	127.7	31.2	158.9	25,823	599.1	208.3	807.4
1980	34,999	30,766	130.8	31.3	162.2	26,919	619.4	206.3	825.6
1981	36,621	32,111	133.9	31.0	165.0	28,213	639.4	209.4	848.9
1982	38,123	33,375	137.1	29.5	166.6	29,375	658.1	209.3	867.4
1983	39,489	34,495	140.3	29.3	169.6	30,419	675.1	209.0	884.1
1984	41,038	35,784	143.5	30.0	173.5	31,595	693.5	206.0	899.5
1985	42,317	36,849	146.8	29.9	176.7	32,595	710.9	202.2	913.1
1986	43,076	37,464	150.0	28.3	178.3	33,151	727.8	201.1	928.9
1987	43,742	37,982	153.0	28.7	181.7	33,657	745.4	196.4	941.8
1988	44,414	38,506	156.0	28.2	184.2	34,196	763.4	177.0	940.4
1989	44,883	38,858	158.8	27.9	186.7	34,579	781.7	175.4	957.1
1990	45,385	39,244	161.5	27.6	189.0	34,975	800.4	177.6	978.0
1991	45,776	39,558	164.2	25.9	190.1	35,254	819.1	175.3	994.4
1992	46,149	39,843	166.8	25.0	191.8	35,539	838.0	173.3	1,011.3
1993	46,513	40,124	169.3	24.1	193.4	35,798	857.2	170.5	1,027.7
1994	46,922	40,417	171.7	23.6	195.3	36,142	877.1	171.9	1,049.1
1995	47,296	40,694	174.1	23.5	197.7	36,433	896.9	173.5	1,070.4
1996	47,557	40,875	176.5	23.3	199.8	36,612	917.0	175.1	1,092.1
1997	47,854	40,977	178.9	23.9	202.8	36,830	937.1	175.7	1,112.8
1998	² 47,664	² 35,143	181.2	22.7	203.9	² 32,458	957.0	141.8	1,098.8

¹ Wet, after lease separation.

² There is a discontinuity in this time series between 1997 and 1998 due to the absence of updates for a subset of the data used in the past.

Note: Data are at end of year.

Web Page: http://www.eia.doe.gov/oil_gas/natural_gas/nat_frame.html.

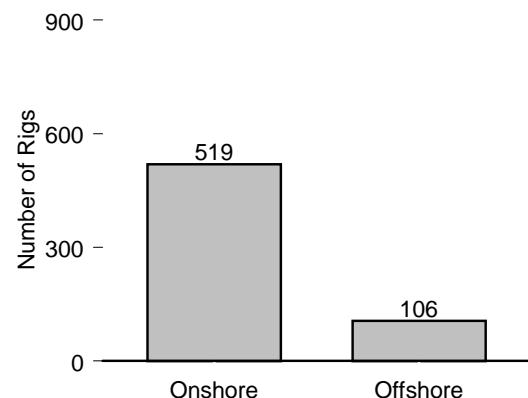
Sources: **Cumulative Production:** Calculated from Energy Information Administration (EIA), *Petroleum*

Supply Annual, annual reports and *Natural Gas Annual*, annual reports. **Proved Reserves:**

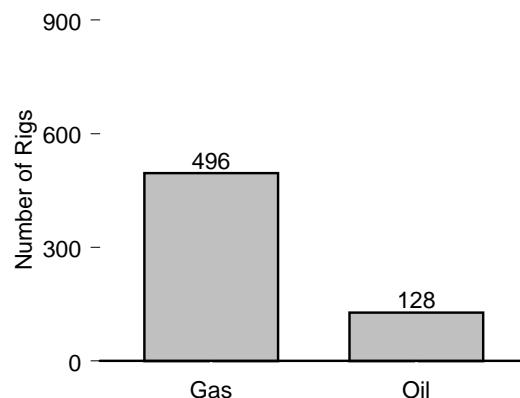
- 1977-1997—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports.
- 1998—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves* (December 1999), Tables 6, 9, and 16. **Field Counts:** EIA, *Oil and Gas Field Code Master List*, annual reports, and EIA, Office of Oil and Gas, Oil and Gas Integrated Field File.

Figure 4.3 Oil and Gas Drilling Activity Measurements

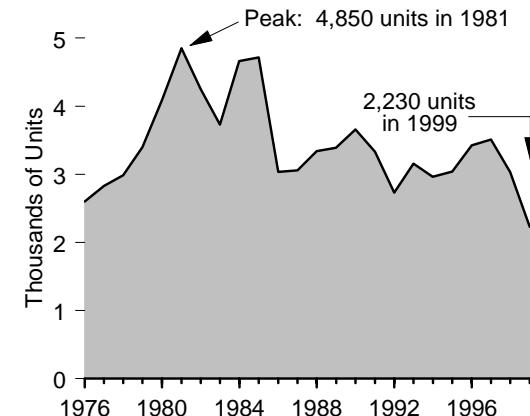
Rotary Rigs in Operation by Site, 1999



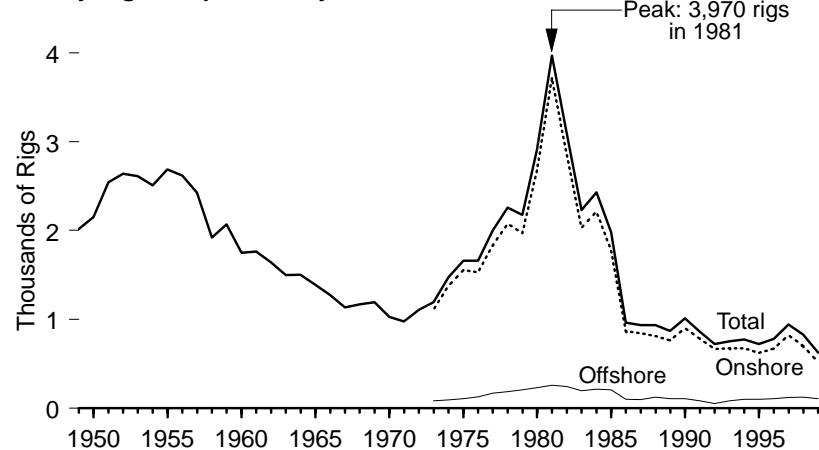
Rotary Rigs in Operation by Type, 1999



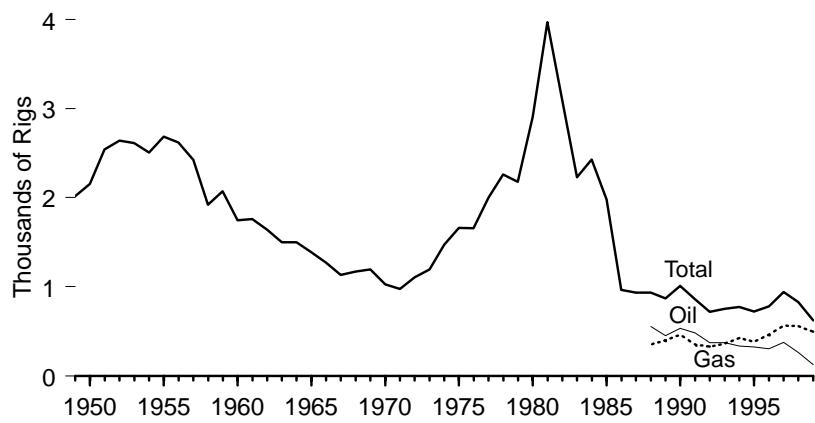
Active Well Servicing Units, 1976-1999



Rotary Rigs in Operation by Site, 1949-1999



Rotary Rigs in Operation by Type, 1949-1999



Source: Table 4.3.

Table 4.3 Oil and Gas Drilling Activity Measurements, 1949-1999

Year	Rotary Rigs in Operation ¹					Active Well Servicing Units	
	By Site		By Type		Total ²		
	Offshore	Onshore	Oil	Gas			
1949	NA	NA	NA	NA	2,017	NA	
1950	NA	NA	NA	NA	2,154	NA	
1951	NA	NA	NA	NA	2,543	NA	
1952	NA	NA	NA	NA	2,641	NA	
1953	NA	NA	NA	NA	2,613	NA	
1954	NA	NA	NA	NA	2,508	NA	
1955	NA	NA	NA	NA	2,686	NA	
1956	NA	NA	NA	NA	2,620	NA	
1957	NA	NA	NA	NA	2,426	NA	
1958	NA	NA	NA	NA	1,922	NA	
1959	NA	NA	NA	NA	2,071	NA	
1960	NA	NA	NA	NA	1,748	NA	
1961	NA	NA	NA	NA	1,761	NA	
1962	NA	NA	NA	NA	1,641	NA	
1963	NA	NA	NA	NA	1,499	NA	
1964	NA	NA	NA	NA	1,501	NA	
1965	NA	NA	NA	NA	1,388	NA	
1966	NA	NA	NA	NA	1,272	NA	
1967	NA	NA	NA	NA	1,135	NA	
1968	NA	NA	NA	NA	1,169	NA	
1969	NA	NA	NA	NA	1,194	NA	
1970	NA	NA	NA	NA	1,028	NA	
1971	NA	NA	NA	NA	976	NA	
1972	NA	NA	NA	NA	1,107	NA	
1973	84	1,110	NA	NA	1,194	NA	
1974	94	1,378	NA	NA	1,472	NA	
1975	106	1,554	NA	NA	1,660	NA	
1976	129	1,529	NA	NA	1,658	2,601	
1977	167	1,834	NA	NA	2,001	2,828	
1978	185	2,074	NA	NA	2,259	2,988	
1979	207	1,970	NA	NA	2,177	3,399	
1980	231	2,678	NA	NA	2,909	4,089	
1981	256	3,714	NA	NA	3,970	4,850	
1982	243	2,862	NA	NA	3,105	4,248	
1983	199	2,033	NA	NA	2,232	3,732	
1984	213	2,215	NA	NA	2,428	4,663	
1985	206	1,774	NA	NA	1,980	4,716	
1986	99	865	NA	NA	964	3,036	
1987	95	841	NA	NA	936	3,060	
1988	123	813	554	354	936	3,341	
1989	105	764	453	401	869	3,391	
1990	108	902	532	464	1,010	3,658	
1991	81	779	482	351	860	3,331	
1992	52	669	373	331	721	2,732	
1993	82	672	373	364	754	3,158	
1994	102	673	335	427	775	2,961	
1995	101	622	323	385	723	3,043	
1996	108	671	306	464	779	3,425	
1997	122	821	376	564	943	R3,499	
1998	123	703	264	560	827	3,030	
1999	106	519	128	496	625	2,230	

¹ Data are not for the exact calendar year but are an average for the 52 or 53 consecutive whole weeks that most nearly coincide with the calendar year.

² Sum of oil, gas, and miscellaneous other rigs, which is not shown.

NA=Not available.

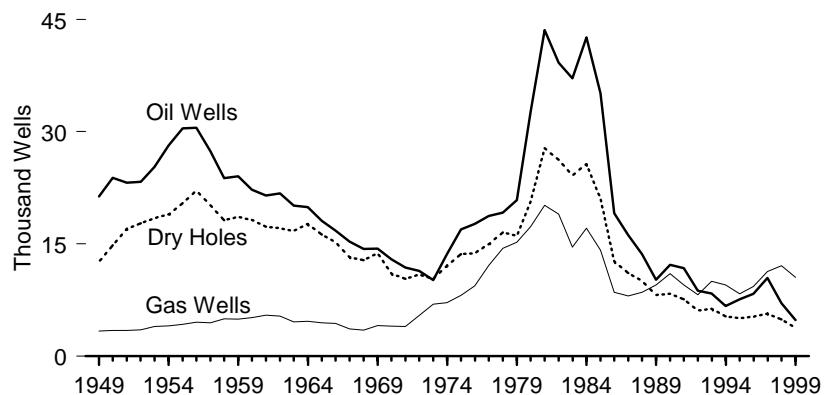
Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal

sum of components due to independent rounding.

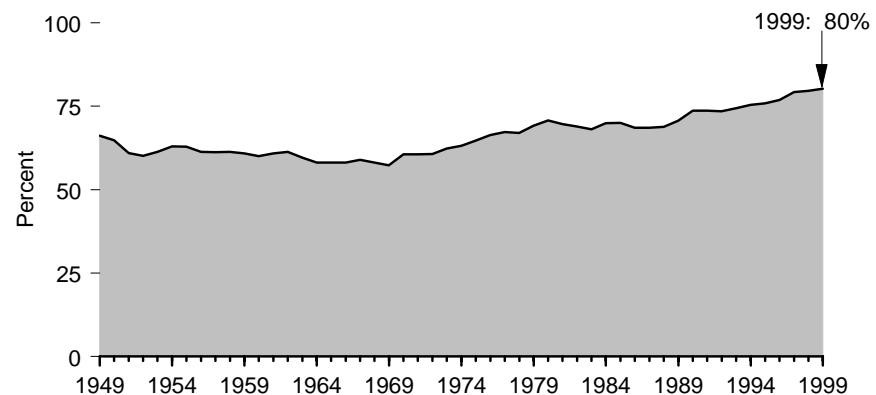
Sources: **Rotary Rigs in Operation:** Baker Hughes, Inc., Houston, Texas, *Rotary Rigs Running—By State*. **Active Well Servicing Units:** • 1976-July 1998—Association of Energy Service Companies, Dallas, Texas, *Field Reports*. • August 1998 forward—Guiberson Well Service Products, a Halliburton company, Carrollton, Texas.

Figure 4.4 Oil and Gas Exploratory and Development Wells, 1949-1999

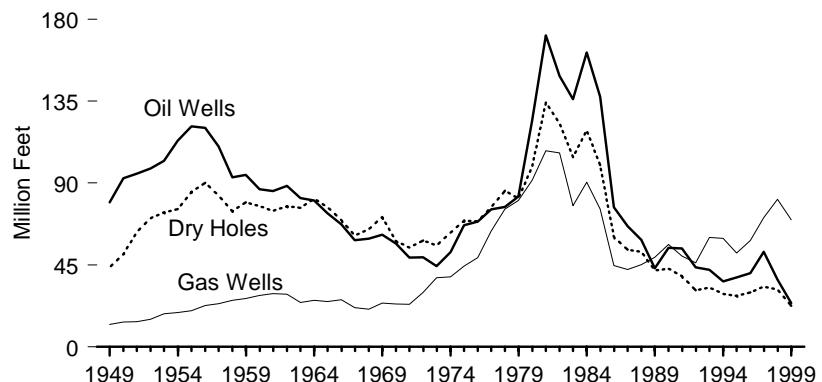
Wells Drilled



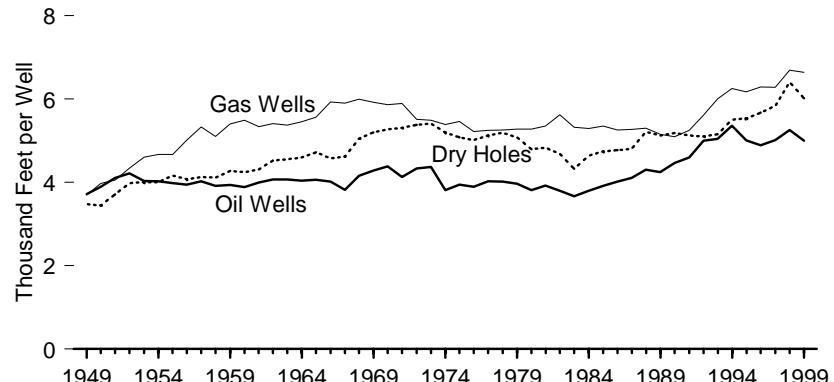
Successful Wells



Footage Drilled



Average Depth



Source: Table 4.4.

Table 4.4 Oil and Gas Exploratory and Development Wells, 1949-1999

Year	Wells Drilled (thousands)				Successful Wells (percent)	Footage Drilled (million feet)				Average Depth (feet per well)			
	Oil	Gas	Dry Holes	Total		Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total
1949	21.35	3.36	12.60	37.31	66.2	79.4	12.4	43.8	135.6	3,720	3,698	3,473	3,635
1950	23.81	3.44	14.80	42.05	64.8	92.7	13.7	51.0	157.4	3,893	3,979	3,445	3,742
1951	23.18	3.44	17.03	43.64	61.0	95.1	13.9	63.1	172.1	4,103	4,056	3,706	3,944
1952	23.29	3.51	17.76	44.56	60.1	98.1	15.3	70.7	184.1	4,214	4,342	3,983	4,132
1953	25.32	3.97	18.45	47.74	61.4	102.1	18.2	73.9	194.2	4,033	4,599	4,004	4,069
1954	28.14	4.04	18.93	51.11	63.0	113.4	18.9	75.8	208.0	4,028	4,670	4,004	4,070
1955	30.43	4.27	20.45	55.15	62.9	121.1	19.9	85.1	226.2	3,981	4,672	4,161	4,101
1956	30.53	4.53	22.11	57.17	61.3	120.4	22.7	90.2	233.3	3,942	5,018	4,079	4,080
1957	27.36	4.48	20.16	52.00	61.2	110.0	23.8	83.2	217.0	4,021	5,326	4,126	4,174
1958	23.77	5.01	18.16	46.94	61.3	93.1	25.6	74.6	193.3	3,916	5,106	4,110	4,118
1959	24.04	4.93	18.59	47.56	60.9	94.6	26.6	79.5	200.7	3,935	5,396	4,275	4,220
1960	22.26	5.15	18.21	45.62	60.1	86.6	28.2	77.4	192.2	3,889	5,486	4,248	4,213
1961	21.44	5.49	17.33	44.25	60.8	85.6	29.3	74.7	189.6	3,994	5,339	4,311	4,285
1962	21.73	5.35	17.08	44.16	61.3	88.4	28.9	77.3	194.6	4,070	5,408	4,524	4,408
1963	20.14	4.57	16.76	41.47	59.6	81.8	24.5	76.3	182.6	4,063	5,368	4,552	4,405
1964	19.91	4.69	17.69	42.29	58.2	80.5	25.6	81.4	187.4	4,042	5,453	4,598	4,431
1965	18.07	4.48	16.23	38.77	58.2	73.3	24.9	76.6	174.9	4,059	5,562	4,723	4,510
1966	16.78	4.38	15.23	36.38	58.1	67.3	25.9	69.6	162.9	4,013	5,928	4,573	4,478
1967	15.33	3.66	13.25	32.23	58.9	58.6	21.6	61.1	141.4	3,825	5,898	4,616	4,385
1968	14.33	3.46	12.81	30.60	58.1	59.5	20.7	64.7	145.0	4,153	5,994	5,053	4,738
1969	14.37	4.08	13.74	32.19	57.3	61.6	24.2	71.4	157.1	4,286	5,918	5,195	4,881
1970	12.97	R4.01	11.03	R28.01	60.6	56.9	23.6	58.1	138.6	4,385	5,860	5,265	4,943
1971	R11.85	R3.97	10.31	R26.13	60.6	49.1	23.5	54.7	127.3	4,126	5,890	5,305	4,858
1972	11.38	5.44	10.89	27.71	60.7	49.3	30.0	58.6	137.8	4,330	5,516	5,377	4,974
1973	10.17	6.93	10.32	27.42	62.4	44.4	38.0	55.8	138.2	4,367	5,487	5,406	5,041
1974	13.65	7.14	12.12	32.90	63.2	52.0	38.4	62.9	153.4	3,810	5,385	5,195	4,662
1975	16.95	8.13	13.65	38.72	64.8	66.8	44.4	69.3	180.5	3,944	5,462	5,076	4,661
1976	17.69	9.41	13.76	40.86	66.3	68.8	49.1	69.0	187.0	3,891	5,221	5,018	4,577
1977	18.75	12.12	14.99	45.85	67.3	75.5	63.6	76.8	215.9	4,025	5,249	5,124	4,708
1978	19.18	14.41	16.55	50.15	67.0	77.0	75.8	R85.8	238.7	4,016	R5,259	R5,187	4,760
1979	20.85	15.25	16.10	52.20	69.2	82.6	80.5	81.7	244.8	R3,963	5,275	R5,075	4,689
1980	32.64	17.33	20.64	70.61	70.8	124.3	R91.5	98.9	314.7	R3,807	R5,278	R4,792	4,456
1981	43.60	20.17	27.79	91.55	69.6	171.1	107.8	134.2	413.1	3,925	5,346	4,828	4,512
1982	39.20	18.98	26.22	84.40	68.9	148.8	106.7	122.8	378.3	3,795	R5,621	4,685	4,482
1983	37.12	14.56	24.15	75.84	68.2	136.1	77.6	104.3	318.0	R3,667	R5,325	4,320	4,193
1984	42.61	17.13	25.68	85.41	69.9	R161.8	90.6	R119.0	371.4	R3,797	5,289	4,636	4,348
1985	35.12	14.17	21.06	70.34	70.1	137.3	R75.8	R99.9	313.0	3,911	R5,353	R4,743	4,450
1986	19.10	R8.52	R12.68	R40.29	R68.5	76.6	44.7	60.5	181.9	R4,013	R5,255	R4,770	R4,514
1987	16.16	8.06	R11.11	R35.33	R68.5	66.3	42.5	53.4	162.2	R4,104	R5,273	R4,803	R4,590
1988	13.64	8.56	10.04	32.23	68.8	58.7	R45.3	52.3	156.4	R4,305	R5,298	R5,211	4,851
1989	10.20	9.54	8.19	27.93	70.7	43.3	49.2	41.9	134.4	4,243	R5,157	R5,123	4,813
1990	12.20	11.04	8.31	R31.56	73.7	54.4	56.2	43.1	153.7	R4,459	R5,091	R5,183	R4,871
1991	11.77	9.53	7.60	R28.89	73.7	54.1	R50.0	R38.9	143.0	4,597	R5,251	R5,121	4,950
1992	8.76	8.21	6.12	23.08	73.5	43.8	46.1	31.2	121.1	R4,999	R5,619	R5,103	5,247
1993	R8.41	10.02	R6.33	R24.75	74.4	42.4	60.1	R32.6	135.1	R5,046	R6,000	R5,150	R5,459
1994	R6.72	9.54	R5.31	R21.57	R75.4	R36.0	59.6	R29.2	R124.8	R5,355	R6,251	R5,502	R5,787
1995 ^E	7.63	R8.35	5.08	R21.06	75.9	R38.2	R51.6	R28.1	R117.8	R5,007	R6,171	R5,535	R5,596
1996 ^E	R8.31	R9.30	R5.28	R22.90	76.9	R40.6	R58.5	R30.0	R129.0	R4,885	R6,286	R5,672	R5,636
1997 ^E	R10.44	R11.33	R5.70	R27.47	79.2	R52.3	R71.1	R33.3	R156.7	R5,009	R6,279	R5,833	R5,704
1998 ^E	R7.06	R12.11	R4.91	R24.08	R79.6	R37.1	R81.0	R31.5	R149.6	R5,256	R6,693	R6,406	R6,213
1999 ^E	4.80	10.51	3.76	19.08	80.3	24.0	69.8	22.6	116.4	5,004	6,640	6,013	6,105

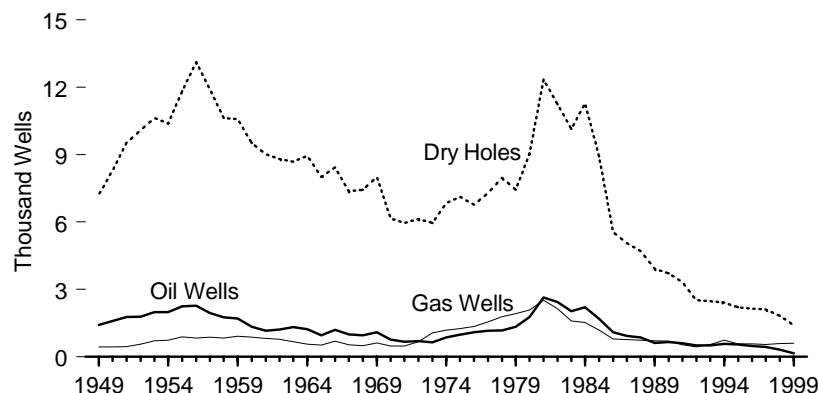
R=Revised. E=Estimated.

Notes: • Service wells, stratigraphic tests, and core tests are excluded. • For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

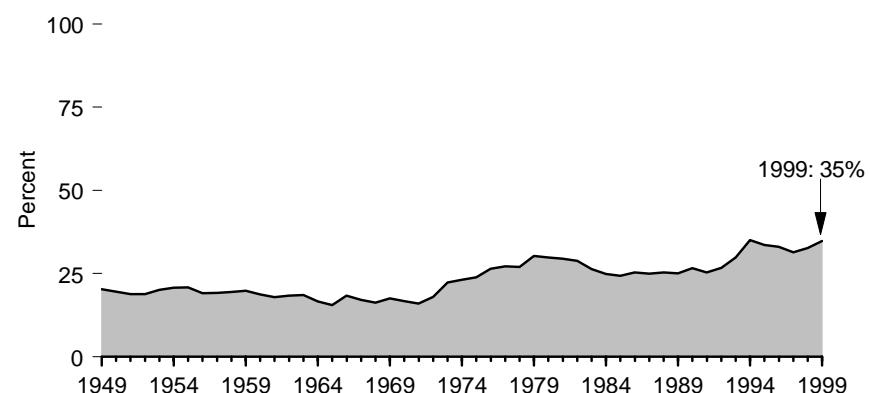
Sources: • 1949-1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" issue. • 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970-1994—Energy Information Administration (EIA) computations based on well reports submitted to the American Petroleum Institute. • 1995 forward—EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc. For current data see the EIA, *Monthly Energy Review*, Section 5.

Figure 4.5 Oil and Gas Exploratory Wells, 1949-1999

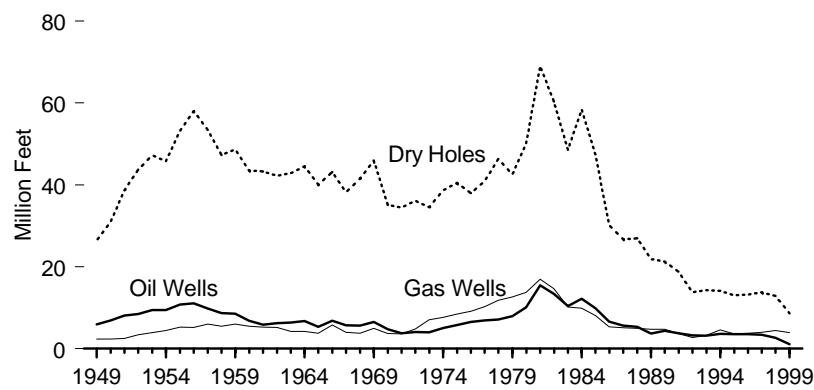
Wells Drilled



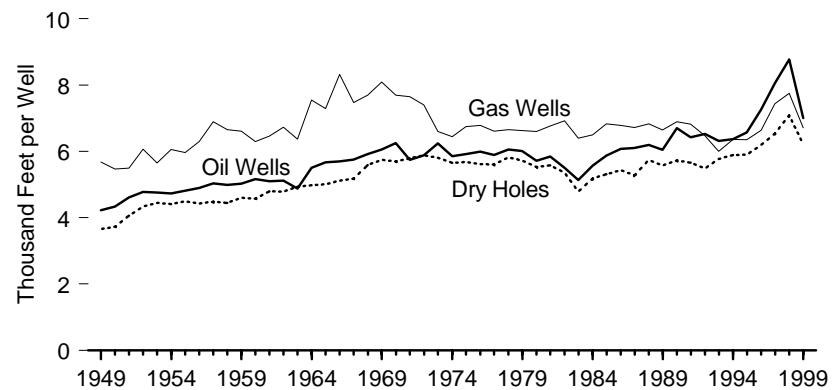
Successful Wells



Footage Drilled



Average Depth



Source: Table 4.5.

Table 4.5 Oil and Gas Exploratory Wells, 1949-1999

Year	Wells Drilled (thousands)				Successful Wells (percent)	Footage Drilled (million feet)				Average Depth (feet per well)			
	Oil	Gas	Dry Holes	Total		Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total
1949	1.41	0.42	7.23	9.06	20.2	6.0	2.4	26.4	34.8	4,232	5,682	3,658	3,842
1950	1.58	0.43	8.29	10.31	19.5	6.9	2.4	31.0	40.2	4,335	5,466	3,733	3,898
1951	1.76	0.45	9.54	11.76	18.9	8.1	2.5	38.7	49.3	4,609	5,497	4,059	4,197
1952	1.78	0.56	10.09	12.43	18.8	8.5	3.4	43.7	55.6	4,781	6,071	4,334	4,476
1953	1.98	0.70	10.63	13.31	20.1	9.4	4.0	47.3	60.7	4,761	5,654	4,447	4,557
1954	1.99	0.73	10.39	13.10	20.7	9.4	4.4	45.8	59.6	4,740	6,059	4,408	4,550
1955	2.24	0.87	11.83	14.94	20.8	10.8	5.2	53.2	69.2	4,819	5,964	4,498	4,632
1956	2.27	0.82	13.12	16.21	19.1	11.1	5.2	58.0	74.3	4,901	6,301	4,425	4,587
1957	1.95	0.87	11.90	14.71	19.1	9.8	6.0	53.4	69.2	5,036	6,898	4,488	4,702
1958	1.75	0.82	10.63	13.20	19.4	8.7	5.5	47.3	61.5	4,993	6,657	4,449	4,658
1959	1.70	0.91	10.58	13.19	19.8	8.5	6.0	48.7	63.3	5,021	6,613	4,602	4,795
1960	1.32	0.87	9.52	11.70	18.7	6.8	5.5	43.5	55.8	5,170	6,298	4,575	4,770
1961	1.16	0.81	9.02	10.99	17.9	5.9	5.2	43.3	54.4	5,099	6,457	4,799	4,953
1962	1.21	0.77	8.82	10.80	18.4	6.2	5.2	42.2	53.6	5,124	6,728	4,790	4,966
1963	1.31	0.66	8.69	10.66	18.5	6.4	4.2	42.8	53.5	4,878	6,370	4,933	5,016
1964	1.22	0.56	8.95	10.73	16.6	6.7	4.2	44.6	55.5	5,509	7,547	4,980	5,174
1965	0.95	0.52	8.01	9.47	15.4	5.4	3.8	40.1	49.2	5,672	7,295	5,007	5,198
1966	1.20	0.70	8.42	10.31	18.4	6.8	5.8	43.1	55.7	5,700	8,321	5,117	5,402
1967	0.99	0.53	7.36	8.88	17.1	5.7	4.0	38.2	47.8	5,758	7,478	5,188	5,388
1968	0.95	0.49	7.44	8.88	16.2	5.6	3.7	41.6	51.0	5,914	7,697	5,589	5,739
1969	1.08	0.62	8.00	9.70	17.5	6.6	5.0	45.9	57.5	6,054	8,092	5,739	5,924
1970	0.76	0.48	6.16	7.40	16.7	4.7	3.7	35.1	43.5	6,247	7,695	5,700	5,885
1971	0.66	0.47	5.95	7.08	R15.9	3.8	3.6	34.5	41.9	5,745	7,649	5,796	5,915
1972	0.69	0.66	6.13	R7.48	17.9	4.0	4.8	36.1	45.0	5,880	7,400	5,882	6,015
1973	0.64	1.07	5.95	7.66	22.3	4.0	7.0	34.6	45.6	6,246	6,600	5,811	5,957
1974	0.86	1.19	6.83	8.88	23.1	5.0	7.7	38.6	51.3	5,854	6,450	5,653	5,780
1975	0.98	1.25	7.13	9.36	23.8	5.8	8.4	40.5	54.7	5,919	6,751	5,679	5,847
1976	1.09	1.35	6.77	9.20	26.4	6.5	9.1	38.0	R53.6	R5,991	6,786	5,613	5,829
1977	1.16	1.55	7.28	10.00	27.1	6.9	10.2	40.9	57.9	5,895	6,611	5,609	5,798
1978	1.17	1.77	7.97	10.91	27.0	7.1	11.8	46.3	65.2	6,065	6,659	R5,816	R5,979
1979	1.32	1.91	7.44	10.67	30.3	7.9	12.6	42.6	R63.1	6,017	R6,628	R5,722	R5,920
1980	1.76	2.08	9.04	12.88	29.8	10.1	13.7	50.1	73.9	R6,717	R6,602	R5,538	R5,734
1981	2.64	2.51	12.35	17.50	29.4	15.4	17.0	68.9	101.4	R6,849	R6,762	5,583	5,792
1982	2.43	2.13	11.25	15.80	28.8	13.4	14.7	60.3	88.4	R5,500	R6,919	5,360	5,591
1983	2.02	1.59	10.15	13.76	26.3	10.4	10.2	48.6	69.2	R5,133	R6,400	R4,789	R5,026
1984	2.20	1.52	11.28	15.00	24.8	12.2	9.9	58.4	R80.5	R5,568	R6,498	R5,179	R5,370
1985	1.68	1.19	8.92	11.79	24.3	9.9	8.1	R47.4	R65.4	R5,869	R6,828	R5,316	R5,548
1986	1.08	0.79	5.55	7.43	25.3	6.6	5.4	R30.1	R42.1	R6,072	R6,782	R5,431	R5,669
1987	0.93	0.75	5.05	6.73	25.0	R5.6	5.1	26.7	37.4	R6,102	R6,714	R5,287	R5,559
1988	0.86	0.73	4.69	6.28	25.3	5.3	5.0	27.0	37.3	R6,198	R6,832	R5,749	R5,936
1989	0.61	R0.71	3.92	5.24	R25.1	3.7	4.7	21.9	30.2	R6,053	R6,644	R5,577	5,776
1990	0.65	0.69	3.72	5.06	26.6	4.4	R4.7	21.3	30.4	R6,703	R6,894	R5,728	R6,013
1991	0.59	0.53	3.31	4.44	25.4	3.8	3.6	18.8	R26.2	R6,429	R6,820	R5,666	R5,907
1992	0.49	0.42	2.51	3.43	26.7	3.2	R2.7	13.8	19.8	R6,529	R6,474	R5,490	R5,761
1993	0.50	0.55	2.47	3.52	29.8	3.2	3.3	14.3	20.7	R6,317	R5,997	R5,773	R5,886
1994	0.57	R0.73	R2.41	R3.70	R35.0	3.6	4.6	R14.2	R22.4	R6,374	R6,365	R5,891	R6,059
1995E	0.54	0.57	2.20	3.31	33.6	R3.6	3.6	R13.0	R20.1	R6,572	R6,349	R5,897	R6,086
1996E	0.48	R0.57	R2.14	R3.19	R33.0	3.5	R3.8	R13.2	R20.5	R7,266	R6,640	R6,199	R6,440
1997E	R0.43	R0.54	R2.11	R3.07	R31.4	R3.4	R4.0	R13.8	R21.2	R8,059	R7,441	R6,539	R6,908
1998E	R0.30	R0.58	R1.82	R2.70	R32.7	R2.7	R4.5	R12.9	R20.0	R8,777	R7,750	R7,092	R7,423
1999E	0.15	0.59	1.39	2.13	34.7	1.1	3.9	8.6	13.6	7,011	6,709	6,214	6,407

R=Revised. E=Estimated.

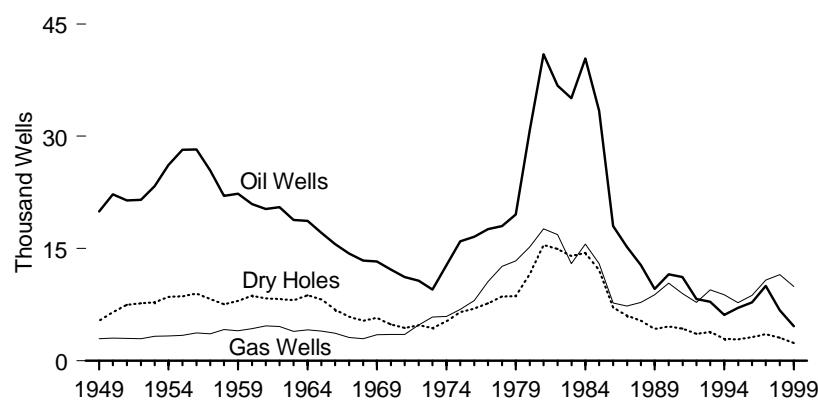
Notes: • For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

Sources: • 1949-1960—American Association of Petroleum Geologists, *Statistics on Exploratory Drilling*

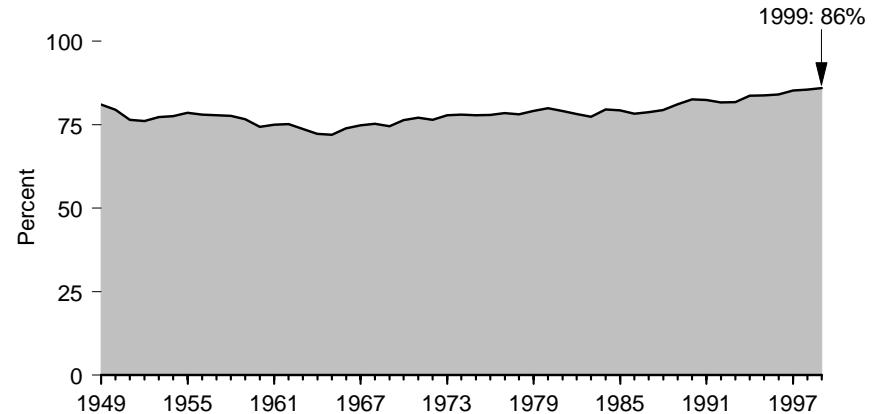
in the United States, 1940 through 1960 (1962), pp. 4-19. • 1961-1965—*Bulletin of the American Association of Petroleum Geologists*, "North American Developments" issue. • 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970-1994—Energy Information Administration (EIA) computations based on well reports submitted to the American Petroleum Institute. • 1995 forward—EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc. For current data see the EIA *Monthly Energy Review*, Section 5.

Figure 4.6 Oil and Gas Development Wells, 1949-1999

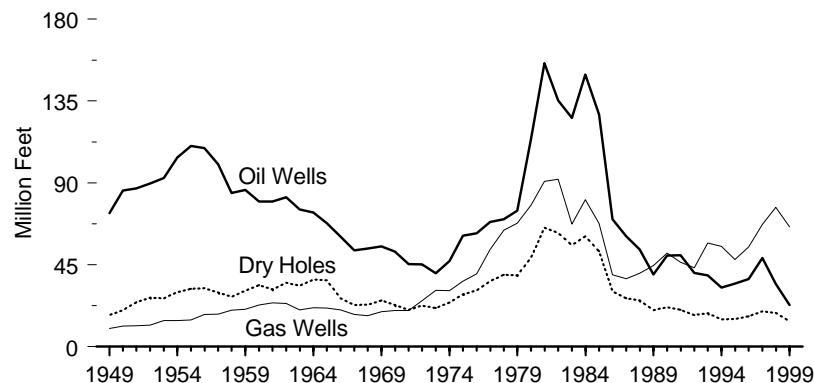
Wells Drilled



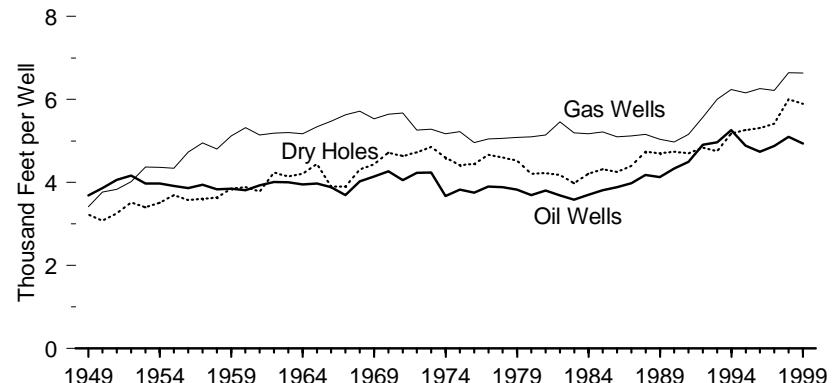
Successful Wells



Footage Drilled



Average Depth



Source: Table 4.6.

Table 4.6 Oil and Gas Development Wells, 1949-1999

Year	Wells Drilled (thousands)				Successful Wells (percent)	Footage Drilled (million feet)				Average Depth (feet per well)			
	Oil	Gas	Dry Holes	Total		Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total
1949	19.95	2.94	5.37	28.25	81.0	73.5	10.0	17.3	100.8	3,684	3,412	3,225	3,568
1950	22.23	3.01	6.51	31.74	79.5	85.8	11.3	20.0	117.2	3,861	3,766	3,077	3,691
1951	21.42	2.98	7.49	31.89	76.5	87.0	11.5	24.4	122.8	4,061	3,837	3,255	3,851
1952	21.51	2.96	7.67	32.14	76.1	89.7	11.9	27.0	128.5	4,167	4,015	3,520	3,999
1953	23.34	3.27	7.82	34.43	77.3	92.7	14.3	26.6	133.6	3,972	4,373	3,401	3,880
1954	26.16	3.31	8.54	38.01	77.5	104.0	14.5	30.0	148.4	3,974	4,365	3,512	3,905
1955	28.20	3.39	8.62	40.21	78.6	110.4	14.7	31.9	157.0	3,915	4,339	3,699	3,904
1956	28.26	3.71	8.99	40.96	78.0	109.2	17.6	32.1	158.9	3,865	4,734	3,574	3,880
1957	25.42	3.61	8.25	37.28	77.9	100.2	17.9	29.7	147.9	3,944	4,950	3,605	3,966
1958	22.03	4.18	7.53	33.74	77.7	84.4	20.1	27.3	131.8	3,831	4,801	3,631	3,907
1959	22.34	4.02	8.01	34.37	76.7	86.1	20.6	30.8	137.4	3,852	5,120	3,844	3,999
1960	20.94	4.28	8.70	33.92	74.4	79.7	22.8	33.8	136.3	3,809	5,321	3,889	4,020
1961	20.28	4.67	8.31	33.26	75.0	79.7	24.0	31.4	135.2	3,931	5,145	3,782	4,064
1962	20.52	4.58	8.26	33.36	75.2	82.2	23.8	35.0	141.0	4,008	5,186	4,239	4,227
1963	18.82	3.91	8.08	30.80	73.8	75.4	20.3	33.5	129.2	4,006	5,198	4,143	4,193
1964	18.69	4.14	8.74	31.57	72.3	73.7	21.4	36.8	131.9	3,947	5,171	4,207	4,179
1965	17.12	3.97	8.22	29.31	71.9	68.0	21.2	36.5	125.7	3,970	5,337	4,446	4,288
1966	15.58	3.68	6.81	26.07	73.9	60.5	20.1	26.6	107.2	3,884	5,474	3,900	4,112
1967	14.34	3.13	5.89	23.36	74.8	53.0	17.6	23.0	93.5	3,692	5,629	3,901	4,004
1968	13.38	2.97	5.37	21.72	75.3	53.9	17.0	23.2	94.0	4,027	5,716	4,311	4,328
1969	13.28	3.47	5.74	22.49	74.5	55.0	19.2	25.4	99.6	4,142	5,531	4,437	4,431
1970	12.21	R\$3.53	4.87	R\$20.61	76.4	52.1	19.9	23.0	95.0	4,269	R\$5,644	4,714	R\$4,610
1971	R\$11.19	R\$3.50	4.36	R\$19.05	R\$77.1	45.3	19.8	20.2	85.4	R\$4,049	R\$5,670	4,633	R\$4,480
1972	10.69	R\$4.78	4.76	R\$20.23	76.5	45.2	25.2	22.5	92.9	4,231	R\$5,259	4,725	4,590
1973	9.53	5.87	4.37	19.76	77.9	40.4	31.0	21.2	92.6	4,240	5,285	4,853	4,686
1974	12.79	5.95	5.28	24.02	78.0	47.0	30.8	24.3	102.0	3,672	5,172	4,602	4,248
1975	15.97	6.88	6.52	29.36	77.8	61.0	36.0	28.8	125.8	3,822	5,228	4,417	4,284
1976	16.60	8.06	6.99	31.65	77.9	62.3	40.0	31.0	133.3	3,753	4,960	4,441	4,213
1977	17.58	10.57	7.70	35.86	78.5	68.6	53.4	35.9	157.9	R\$3,902	5,050	4,664	4,404
1978	18.01	12.64	8.59	39.24	78.1	69.9	64.0	39.5	R\$173.5	R\$3,882	R\$5,063	R\$4,603	R\$4,421
1979	19.53	13.35	8.66	41.54	79.1	74.7	67.8	R\$39.2	R\$181.7	R\$3,824	R\$5,081	R\$4,521	4,373
1980	30.88	15.25	11.60	57.73	79.9	114.2	77.7	48.8	240.8	R\$3,698	R\$5,098	4,211	4,171
1981	40.96	17.65	15.44	74.05	79.2	155.7	90.8	65.2	311.8	R\$3,802	5,145	4,224	4,210
1982	36.77	16.85	14.97	68.59	78.2	135.4	92.0	62.5	289.9	3,683	5,458	4,177	4,227
1983	35.10	12.97	14.01	62.07	77.4	125.7	67.4	55.7	248.8	R\$3,582	R\$5,193	3,980	4,008
1984	40.41	15.61	14.40	70.42	79.5	149.5	80.7	60.6	R\$290.9	R\$3,701	5,171	R\$4,210	R\$4,131
1985	33.44	12.98	12.13	58.55	79.3	127.5	67.7	52.4	247.6	R\$3,813	R\$5,218	R\$4,320	4,229
1986	18.01	7.72	R\$7.13	R\$32.87	78.3	70.1	39.4	30.3	R\$139.8	R\$3,889	R\$5,098	R\$4,255	R\$4,253
1987	15.24	7.30	R\$6.06	R\$28.60	78.8	60.7	37.4	26.7	R\$124.8	3,983	R\$5,124	R\$4,399	R\$4,362
1988	12.78	7.82	5.35	R\$25.95	79.4	53.4	R\$40.3	25.3	119.1	R\$4,179	R\$5,155	R\$4,739	R\$4,588
1989	9.60	R\$8.83	4.26	22.70	81.2	39.6	44.5	R\$20.1	104.2	R\$4,129	R\$5,039	R\$4,705	4,591
1990	R\$11.54	R\$10.36	R\$4.60	R\$26.50	R\$82.6	50.0	51.5	21.8	123.3	R\$4,332	R\$4,971	R\$4,742	R\$4,653
1991	11.18	8.99	R\$4.28	R\$24.45	82.5	50.3	46.4	20.1	116.8	R\$4,500	R\$5,158	R\$4,699	R\$4,777
1992	8.26	7.79	3.61	19.66	81.7	40.6	43.4	17.4	101.4	4,908	5,573	R\$4,834	R\$5,158
1993	R\$7.91	9.47	R\$3.86	R\$21.23	81.8	39.2	R\$56.8	18.3	114.4	R\$4,965	R\$6,001	R\$4,752	R\$5,388
1994	R\$6.15	R\$8.81	R\$2.90	R\$17.87	83.8	32.4	55.0	R\$15.0	R\$102.4	R\$5,260	R\$6,241	R\$5,180	R\$5,731
1995E	7.09	R\$7.78	2.88	R\$17.75	83.8	34.6	R\$47.9	R\$15.1	R\$97.7	R\$4,887	R\$6,158	R\$5,259	R\$5,505
1996E	R\$7.83	R\$8.73	R\$3.15	R\$19.71	R\$84.0	37.1	R\$54.7	R\$16.7	R\$108.5	R\$4,738	R\$6,263	R\$5,314	R\$5,506
1997E	R\$10.01	R\$10.79	R\$3.59	R\$24.39	R\$85.3	48.8	R\$67.1	R\$19.5	R\$135.4	R\$4,879	R\$6,222	R\$5,418	R\$5,552
1998E	R\$6.76	R\$11.53	R\$3.10	R\$21.39	R\$85.5	34.5	R\$76.5	R\$18.6	R\$129.6	R\$5,098	R\$6,640	R\$6,003	R\$6,060
1999E	4.65	9.93	2.37	16.95	86.0	23.0	65.9	14.0	102.8	4,938	6,636	5,895	6,067

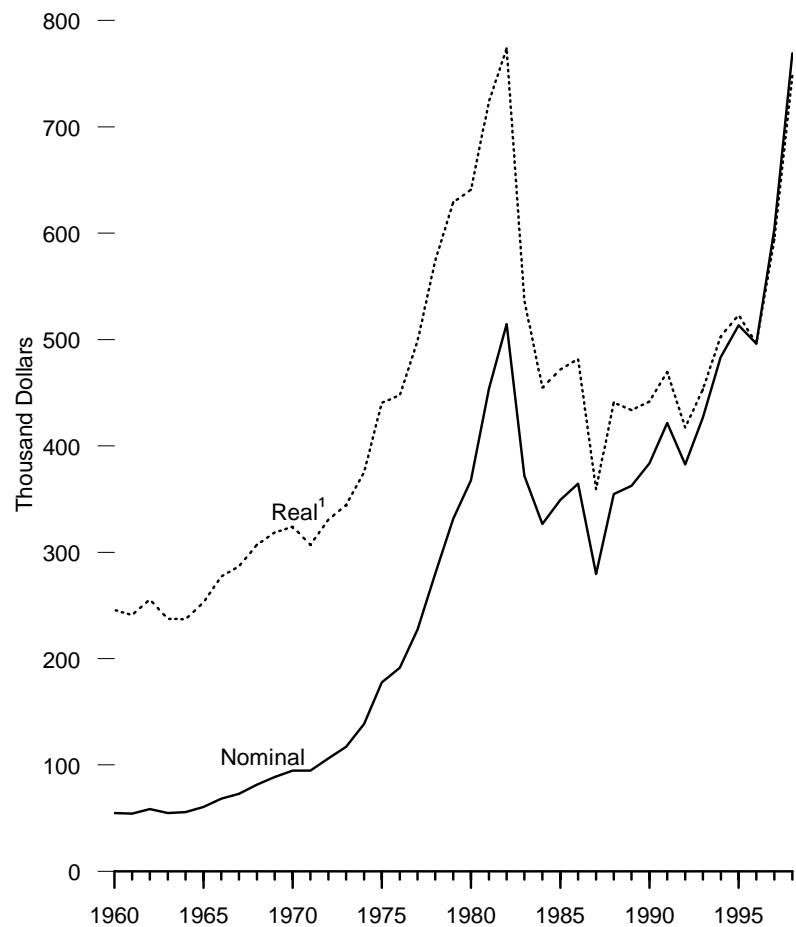
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Notes: • Service wells, stratigraphic tests, and core tests are excluded. • For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

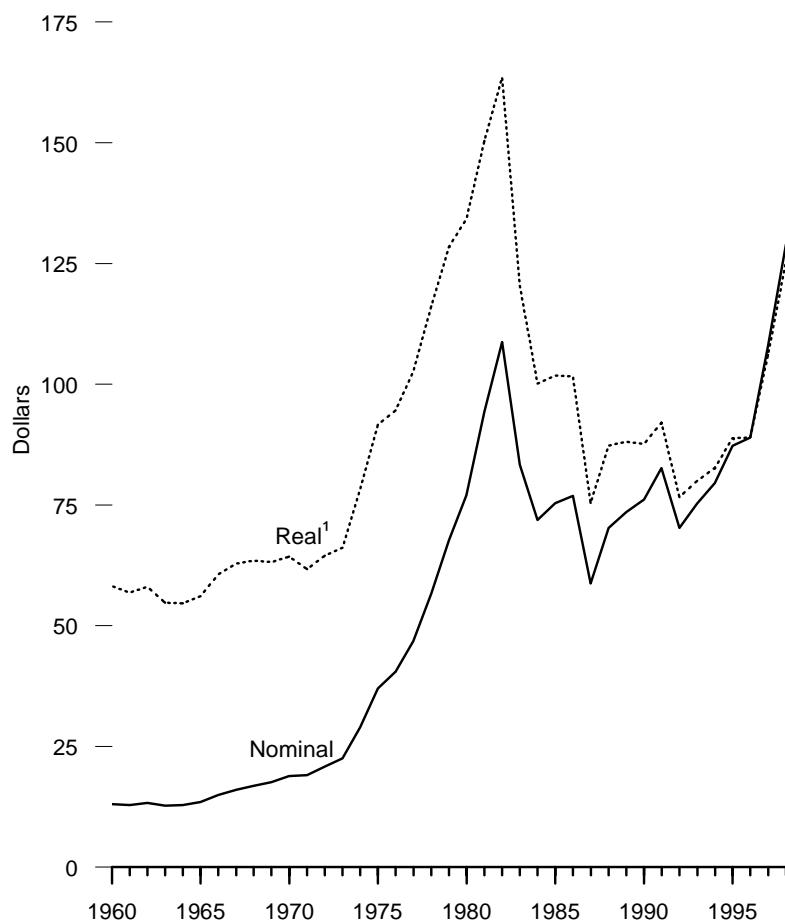
Sources: • 1949-1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" issue. • 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970-1994—Energy Information Administration (EIA) computations based on well reports submitted to the American Petroleum Institute. • 1995 forward—EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc. For current data see the EIA *Monthly Energy Review*, Section 5.

Figure 4.7 Costs of Oil and Gas Wells Drilled, 1960-1998

Costs per Well, All Wells



Costs per Foot, All Wells



¹In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

Source: Table 4.7.

Table 4.7 Costs of Oil and Gas Wells Drilled, 1960-1998

Year	Costs per Well (thousand dollars)					Costs per Foot (dollars)				
	Oil (nominal)	Gas (nominal)	Dry Holes (nominal)	All		Oil (nominal)	Gas (nominal)	Dry Holes (nominal)	All	
				(nominal)	(real) ¹				(nominal)	(real) ¹
1960	52.2	102.7	44.0	54.9	R247.6	13.22	18.57	10.56	13.01	R58.63
1961	51.3	94.7	45.2	54.5	R243.0	13.11	17.65	10.56	12.85	R57.26
1962	54.2	97.1	50.8	58.6	R257.9	13.41	18.10	11.20	13.31	R58.53
1963	51.8	92.4	48.2	55.0	R239.2	13.20	17.19	10.58	12.69	R55.17
1964	50.6	104.8	48.5	55.8	R239.2	13.12	18.57	10.64	12.86	R55.10
1965	56.6	101.9	53.1	60.6	R255.0	13.94	18.35	11.21	13.44	R56.52
1966	62.2	133.8	56.9	68.4	R279.6	15.04	21.75	12.34	14.95	R61.12
1967	66.6	141.0	61.5	72.9	R289.2	16.61	23.05	12.87	15.97	R63.35
1968	79.1	148.5	66.2	81.5	R309.7	18.63	24.05	12.88	16.83	R63.99
1969	86.5	154.3	70.2	88.6	R321.0	19.28	25.58	13.23	17.56	R63.65
1970	86.7	160.7	80.9	94.9	R326.5	19.29	26.75	15.21	18.84	R64.83
1971	78.4	166.6	86.8	94.7	R310.3	18.41	27.70	16.02	19.03	R62.35
1972	93.5	157.8	94.9	106.4	R334.5	20.77	27.78	17.28	20.76	R65.24
1973	103.8	155.3	105.8	117.2	R348.7	22.54	27.46	19.22	22.50	R66.96
1974	110.2	189.2	141.7	138.7	R378.8	27.82	34.11	26.76	28.93	R79.00
1975	138.6	262.0	177.2	177.8	R444.1	34.17	46.23	33.86	36.99	R92.41
1976	151.1	270.4	190.3	191.6	R453.0	37.35	49.78	36.94	40.46	R95.65
1977	170.0	313.5	230.2	227.2	R504.6	41.16	57.57	43.49	46.81	R103.98
1978	208.0	374.2	281.7	280.0	R580.4	49.72	68.37	52.55	56.63	R117.42
1979	243.1	443.1	339.6	331.4	R634.2	58.29	80.66	64.60	67.70	R129.57
1980	272.1	536.4	376.5	367.7	R644.6	66.36	95.16	73.70	77.02	R135.03
1981	336.3	698.6	464.0	453.7	R727.4	80.40	122.17	90.03	94.30	R151.19
1982	347.4	864.3	515.4	514.4	R776.4	86.34	146.20	104.09	108.73	R164.12
1983	283.8	608.1	366.5	371.7	R539.7	72.65	108.37	79.10	83.34	R120.99
1984	262.1	489.8	329.2	326.5	R457.0	66.32	88.80	67.18	71.90	R100.64
1985	270.4	508.7	372.3	349.4	R474.1	66.78	93.09	73.69	75.35	R102.25
1986	284.9	522.9	389.2	364.6	R484.1	68.35	93.02	76.53	76.88	R102.08
1987	246.0	380.4	259.1	279.6	R360.4	58.35	69.55	51.05	58.71	R75.68
1988	279.4	460.3	366.4	354.7	R442.2	62.28	84.65	66.96	70.23	R87.56
1989	282.3	457.8	355.4	362.2	R435.0	64.92	86.86	67.61	73.55	R88.33
1990	321.8	471.3	367.5	383.6	R443.4	69.17	90.73	67.49	76.07	R87.93
1991	346.9	506.6	441.2	421.5	R470.1	73.75	93.10	83.05	82.64	R92.17
1992	362.3	426.1	357.6	382.6	R416.6	69.50	72.83	67.82	70.27	R76.51
1993	356.6	521.2	387.7	426.8	R453.8	67.52	83.15	72.56	75.30	R80.06
1994	409.5	535.1	491.5	483.2	R503.3	70.57	81.90	86.60	79.49	R82.79
1995	415.8	629.7	481.2	513.4	R523.4	78.09	95.97	84.60	87.22	R88.91
1996	341.0	616.0	541.0	496.1	R496.1	70.60	98.67	95.74	88.92	R88.92
1997	445.6	728.6	655.6	603.9	R592.6	90.48	117.55	115.09	107.83	R105.81
1998	566.0	815.6	973.2	769.1	745.9	108.88	127.94	157.79	128.97	125.08

¹ In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

R=Revised.

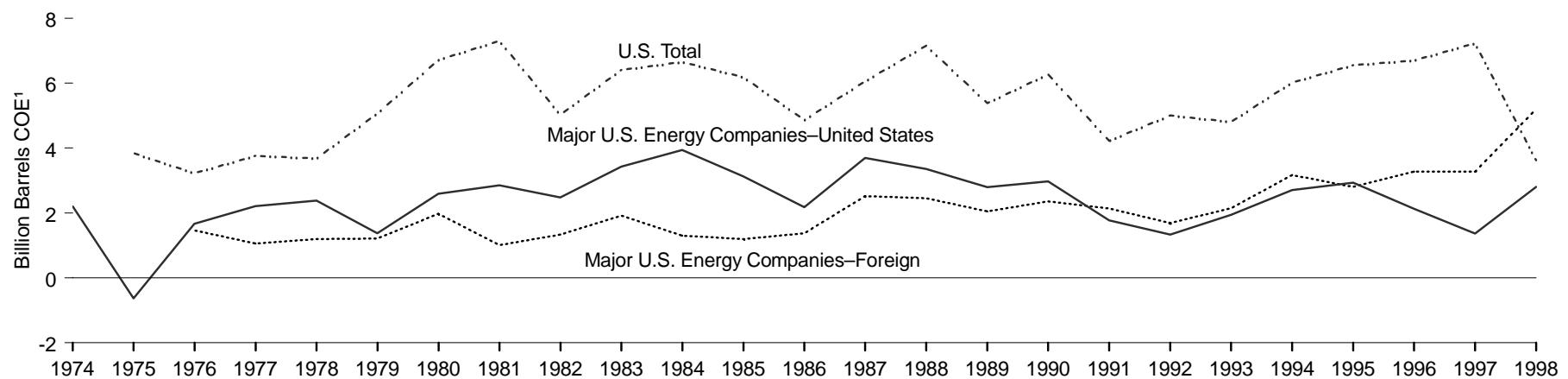
Notes: • The information reported for 1965 and prior years is not strictly comparable to that in the more recent surveys. • Average cost is the arithmetic mean and includes all costs for drilling and equipping

wells and for surface-producing facilities. Wells drilled include exploratory and development wells; excludes service wells, stratigraphic tests, and core tests.

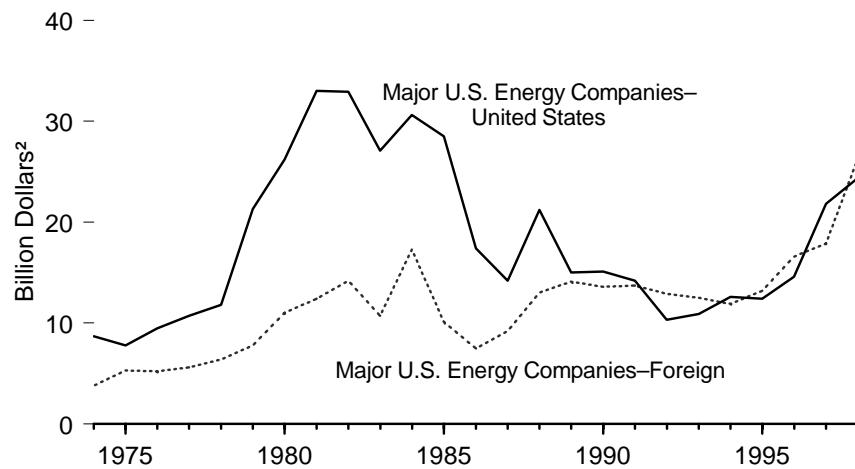
Source: American Petroleum Institute, Independent Petroleum Association of America, Mid-Continent Oil and Gas Association, 1999 Joint Association Survey on Drilling Costs.

Figure 4.8 Gross Additions to Proved Reserves and Exploration and Development Expenditures by Geographic Area

Gross Additions to Proved Reserves of Liquid and Gaseous Hydrocarbons, 1974-1998



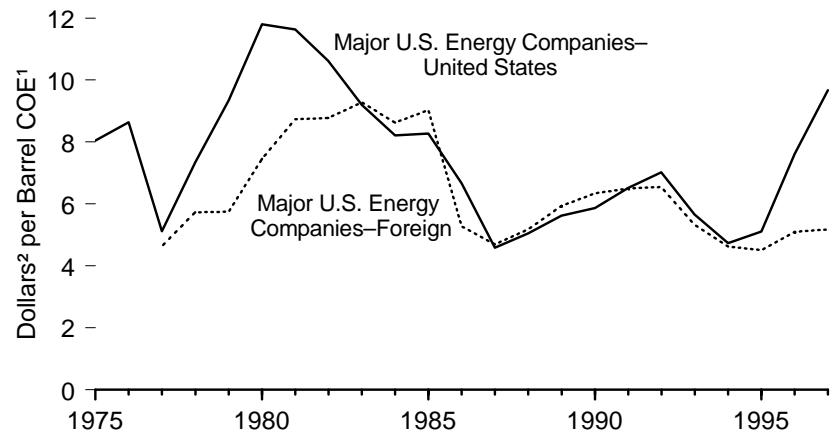
Exploration and Development Expenditures, 1974-1998



¹ Crude oil equivalent.

² Nominal dollars.

**Expenditures per Barrel of Reserve Additions, 1975-1997
Three-Year Weighted Average**



Note: Major U.S. Energy Companies are the top publicly-owned crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12.

Source: Table 4.8.

Table 4.8 Gross Additions to Proved Reserves and Exploration and Development Expenditures by Geographic Area, 1974-1998

Year	Gross Additions to Proved Reserves ¹ of Liquid and Gaseous Hydrocarbons ² (million barrels COE ³)			Exploration and Development Expenditures (billion dollars ⁴)		Expenditures per Barrel of Reserve Additions, Three-Year Weighted Average (dollars ⁴ per barrel COE ³)	
	U.S. Total	Major U.S. Energy Companies ⁵		Major U.S. Energy Companies ⁵		Major U.S. Energy Companies ⁵	
		United States	Foreign	United States	Foreign	United States	Foreign
1974	NA	2,205	NA	8.7	3.8	NA	NA
1975	3,846	-634	NA	7.8	5.3	8.05	NA
1976	3,224	1,663	1,459	9.5	5.2	8.64	NA
1977	3,765	2,210	1,055	10.7	5.6	5.12	4.64
1978	3,679	2,383	1,191	11.8	6.4	7.34	5.73
1979	5,071	1,378	⁶ 1,208	21.3	7.8	9.34	⁶ 5.75
1980	6,723	2,590	1,977	26.2	11.0	11.80	7.45
1981	7,304	2,848	1,006	33.0	12.4	11.63	8.74
1982	5,030	2,482	1,332	32.9	14.2	⁷ 10.62	⁷ 8.78
1983	6,412	3,427	1,918	27.1	10.7	9.20	9.28
1984	6,653	3,941	1,298	30.6	17.3	78.21	⁷ 8.63
1985	6,190	⁸ 3,129	1,192	28.5	10.1	88.27	9.03
1986	4,866	2,178	⁶ 1,375	17.4	7.5	6.67	⁶ 5.28
1987	6,059	⁸ 3,698	2,516	14.2	9.2	84.58	4.69
1988	7,156	3,359	2,460	21.2	13.0	5.05	5.18
1989	5,385	2,798	2,043	15.0	14.1	5.62	5.94
1990	6,275	2,979	2,355	15.1	13.6	5.87	6.34
1991	4,227	1,772	2,135	14.2	13.7	6.52	6.50
1992	5,006	1,332	1,694	10.3	12.9	7.02	6.55
1993	4,814	1,945	2,147	10.9	12.5	5.66	5.33
1994	6,021	2,703	3,173	12.6	11.9	4.74	4.63
1995	6,558	2,929	2,799	12.4	13.2	5.11	4.51
1996	6,707	2,131	3,280	14.6	16.6	^R 7.61	^R 5.10
1997	7,233	^R 1,367	^R 3,279	^R 21.8	17.9	99.67	^R 5.18
1998	3,628	2,801	5,206	24.4	26.4	NA	NA

¹ Gross additions to proved reserves equal annual change in proved reserves plus annual production.

² Liquid and gaseous hydrocarbons include crude oil, natural gas liquids, and natural gas.

³ Crude oil equivalent: converted to Btu on the basis of annual average conversion factors. See Appendix A.

⁴ Nominal dollars.

⁵ Major U.S. Energy Companies are the top publicly-owned, U.S.-based crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS) (see Table 3.12).

⁶ Data for 1979 exclude downward revisions of 1,225 million barrels COE due to Iranian policies. Data for 1986 exclude downward revisions due to Libyan sanctions.

⁷ Data for 1982 and 1984 are adjusted to exclude purchases of proved reserves associated with mergers among the Financial Reporting System companies.

⁸ Data for 1985 and 1987 exclude downward revisions of 1,477 million barrels COE and 2,396 million

barrels COE, respectively, of Alaska North Slope natural gas reserves.

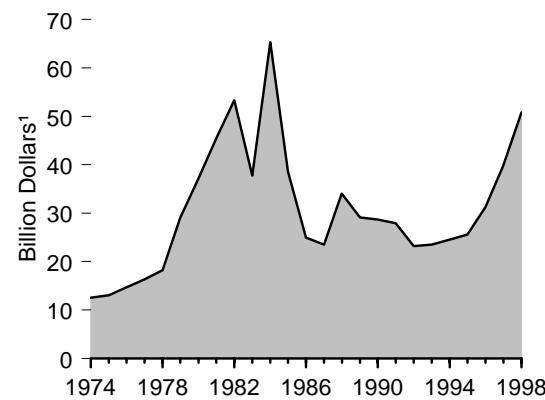
R=Revised. NA=Not available.

Web Page: <http://www.eia.doe.gov/emeu/finance>.

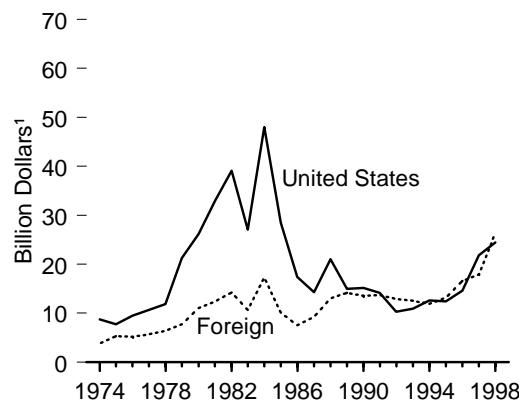
Sources: **Major U.S. Energy Companies:** • 1974-1976—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System" database, November 1997. • 1977-1997—EIA, *Performance Profiles of Major Energy Producers*, annual reports. • 1998—EIA, *Performance Profiles of Major Energy Producers 1998* (January 2000). **U.S. Total, Gross Additions to Proved Reserves of Liquid and Gaseous Hydrocarbons:** • 1975-1979—American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly), *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1979*, Volume 34, June 1980. • 1980 forward—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports.

Figure 4.9 Major U.S. Energy Companies' Expenditures for Oil and Gas Exploration and Development by Region

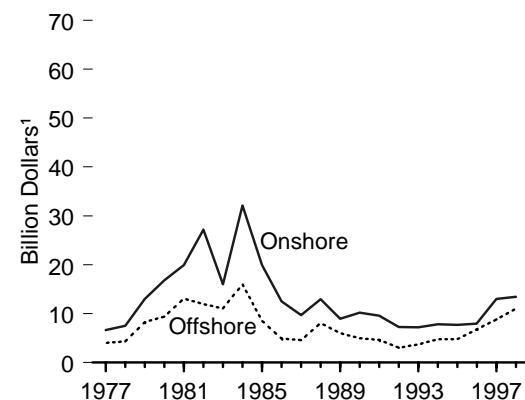
Total, 1974-1998



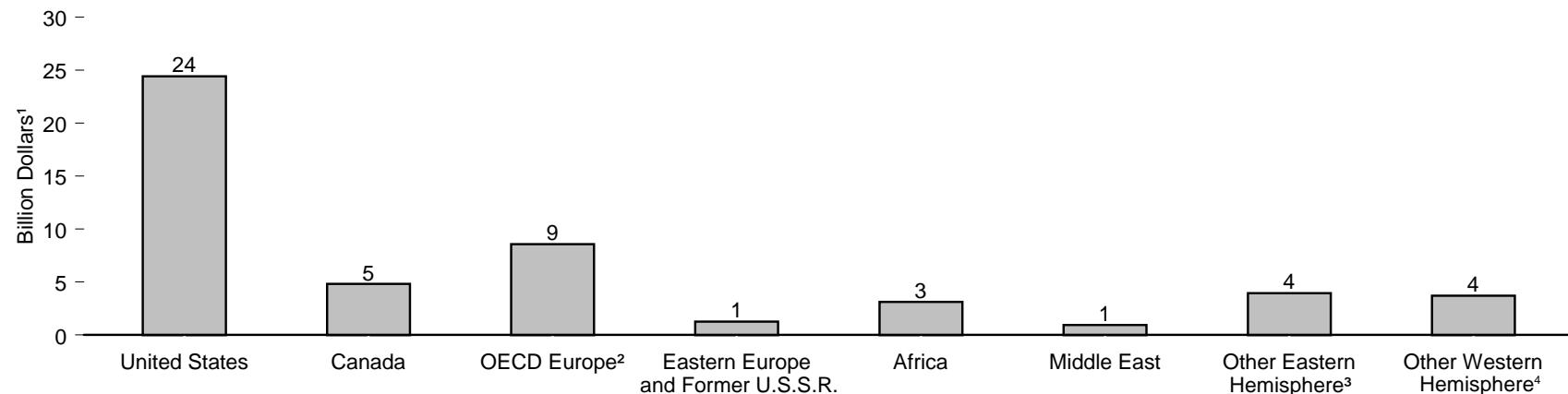
U.S. and Foreign, 1974-1998



U.S. Onshore and Offshore, 1977-1998



By Region, 1998



¹ Nominal dollars.

² Organization for Economic Cooperation and Development. See OECD Europe in Glossary.

³ This region includes areas that are eastward of the Greenwich prime meridian to 180° longitude and that are not included in other specific domestic or foreign classifications.

⁴ This region includes areas that are westward of the Greenwich prime meridian to 180° longitude and that are not included in other specific domestic or foreign classifications.

Notes: • Major U.S. Energy Companies are the top publicly-owned crude oil producers that form the Financial Reporting System (FRS). See Table 3.12. • Because vertical scales differ, graphs should not be compared.

Source: Table 4.9.

Table 4.9 Major U.S. Energy Companies' Expenditures for Oil and Gas Exploration and Development by Region, 1974-1998
(Billion Dollars¹)

Year	United States			Foreign							Total
	Onshore	Offshore	Total	Canada	OECD ² Europe	Eastern Europe and Former U.S.S.R.	Africa	Middle East	Other Eastern Hemisphere ³	Other Western Hemisphere ⁴	
1974	NA	NA	8.7	NA	NA	—	NA	NA	NA	NA	3.8
1975	NA	NA	7.8	NA	NA	—	NA	NA	NA	NA	5.3
1976	NA	NA	9.5	NA	NA	—	NA	NA	NA	NA	5.2
1977	6.7	4.0	10.7	1.5	2.5	—	0.7	0.2	0.3	0.4	5.6
1978	7.5	4.3	11.8	1.6	2.6	—	0.8	0.3	0.4	0.6	6.4
1979	13.0	8.3	21.3	2.3	3.0	—	0.8	0.2	0.5	0.8	7.8
1980	16.8	9.4	26.2	3.1	4.3	—	1.4	0.2	0.8	1.0	11.0
1981	19.9	13.0	33.0	1.8	5.0	—	2.1	0.3	1.9	1.3	12.4
1982	27.2	11.9	39.1	1.9	6.3	—	2.1	0.4	2.4	1.1	14.2
1983	16.0	11.1	27.1	1.6	4.3	—	1.7	0.5	2.0	0.6	10.7
1984	32.1	16.0	48.1	5.4	5.5	—	3.4	0.5	2.0	0.5	17.3
1985	20.0	8.5	28.5	1.9	3.7	—	1.6	0.9	1.3	0.7	10.1
1986	12.5	4.9	17.4	1.1	3.2	—	1.1	0.3	1.2	0.6	7.5
1987	9.7	4.5	14.3	1.9	3.0	—	0.8	0.4	2.8	0.5	9.2
1988	12.9	8.1	21.0	5.4	4.3	—	0.8	0.4	1.4	0.7	13.0
1989	9.0	6.0	15.0	6.3	3.5	—	1.0	0.4	2.3	0.6	14.1
1990	10.2	4.9	15.1	1.8	6.6	—	1.4	0.6	2.4	0.7	13.6
1991	9.6	4.6	14.2	1.7	6.8	—	1.5	0.5	2.4	0.7	13.7
1992	7.3	3.0	10.3	1.1	6.8	—	1.4	0.6	2.4	0.6	12.9
1993	7.2	3.7	10.9	1.6	5.5	0.3	1.5	0.7	2.5	0.6	12.5
1994	7.8	4.8	12.6	1.8	4.4	0.3	1.4	0.4	2.8	0.7	11.9
1995	7.7	4.7	12.4	1.9	5.2	0.4	2.0	0.4	2.4	0.9	13.2
1996	7.9	6.7	14.6	1.6	5.6	0.5	2.8	0.5	4.1	1.6	16.6
1997	R13.0	8.8	R21.8	2.0	7.1	0.6	3.0	0.6	3.0	1.6	17.9
1998	13.5	11.0	24.4	4.8	8.6	1.3	3.1	0.9	3.9	3.7	26.4
											50.8

¹ Nominal dollars.

² Organization for Economic Cooperation and Development. See OECD Europe in Glossary.

³ This region includes areas that are eastward of the Greenwich prime meridian to 180° longitude and that are not included in other domestic or foreign classifications.

⁴ This region includes areas that are westward of the Greenwich prime meridian to 180° longitude and that are not included in other domestic or foreign classifications.

R=Revised. — = Not applicable. NA=Not available.

Notes: • Major U.S. Energy Companies are the top publicly-owned, U.S.-based crude oil and natural gas

producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12.

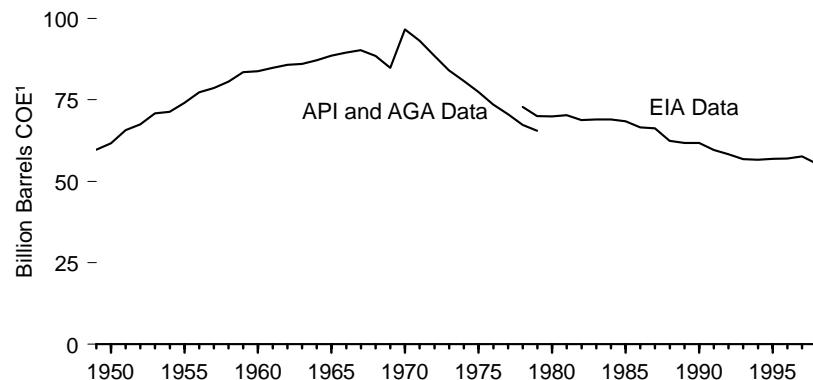
• Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/emeu/finance>.

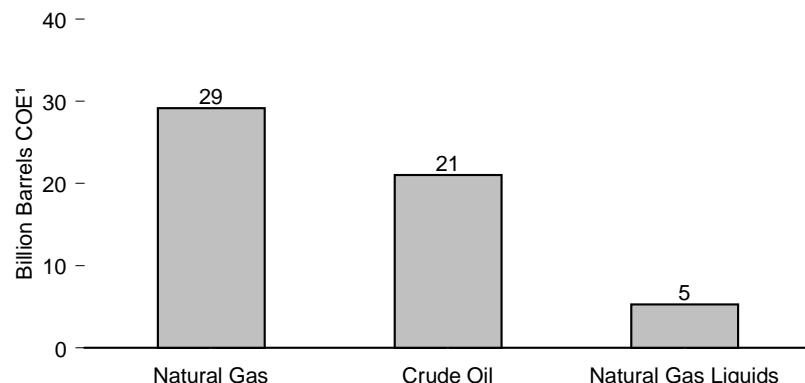
Sources: • 1974-1976—Energy Information Administration (EIA), Office of Energy Markets and End Use, Financial Reporting System Database, November 1997. • 1977-1991—EIA, *Performance Profiles of Major Energy Producers*, annual reports. • 1992-1998—EIA, *Performance Profiles of Major Energy Producers*, 1998 (January 2000), Table B16.

Figure 4.10 Liquid and Gaseous Hydrocarbon Proved Reserves

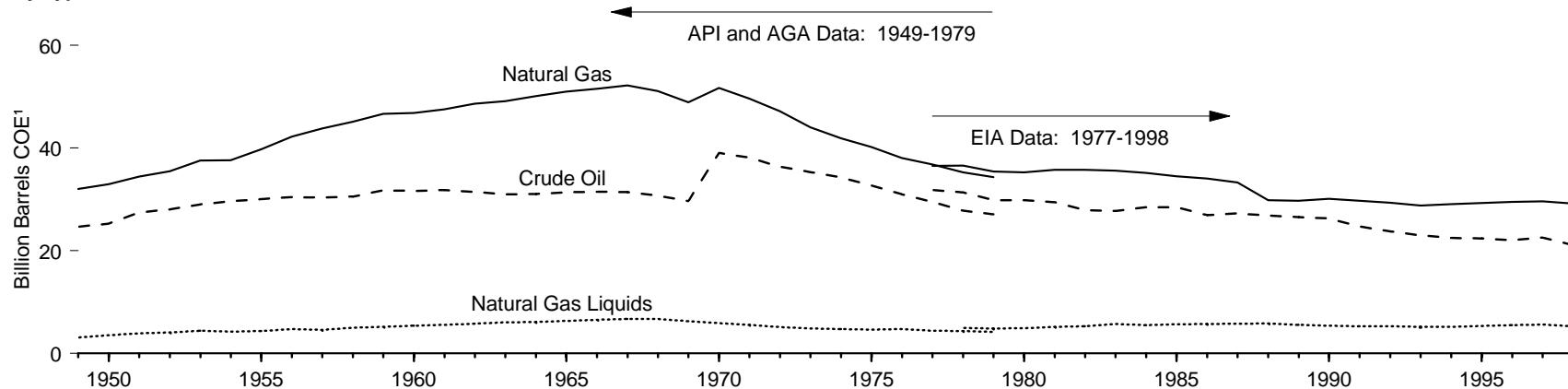
Total, 1949-1998



By Type, 1998



By Type, 1949-1998



¹ COE=crude oil equivalent.

Notes: • Data are at end of year. • API=American Petroleum Institute.
AGA=American Gas Association. • EIA=Energy Information Administration.

• Because vertical scales differ, graphs should not be compared.

Source: Table 4.10.

Table 4.10 Liquid and Gaseous Hydrocarbon Proved Reserves, 1949-1998

Year	Crude Oil		Natural Gas		Natural Gas Liquids		Total
	Billion Barrels	Trillion Cubic Feet ¹	Billion Barrels COE ²	Billion Barrels	Billion Barrels COE ²	Billion Barrels COE ²	Billion Barrels COE ²
American Petroleum Institute and American Gas Association Data							
1949	24.6	179.4	32.0	3.7	3.1		59.7
1950	25.3	184.6	32.9	4.3	3.5		61.7
1951	27.5	192.8	34.4	4.7	3.9		65.7
1952	28.0	198.6	35.4	5.0	4.1		67.5
1953	28.9	210.3	37.5	5.4	4.4		70.9
1954	29.6	210.6	37.6	5.2	4.2		71.3
1955	30.0	222.5	39.7	5.4	4.4		74.1
1956	30.4	236.5	42.2	5.9	4.7		77.3
1957	30.3	245.2	43.8	5.7	4.5		78.6
1958	30.5	252.8	45.1	6.2	5.0		80.6
1959	31.7	261.2	46.6	6.5	5.2		83.5
1960	31.6	262.3	46.8	6.8	5.4		83.8
1961	31.8	266.3	47.5	7.0	5.6		84.8
1962	31.4	272.3	48.6	7.3	5.8		85.7
1963	31.0	276.2	49.1	7.7	6.0		86.1
1964	31.0	281.3	50.0	7.7	6.1		87.1
1965	31.4	286.5	51.0	8.0	6.3		88.6
1966	31.5	289.3	51.5	8.3	6.5		89.5
1967	31.4	292.9	52.1	8.6	6.7		90.2
1968	30.7	287.3	51.1	8.6	6.7		88.5
1969	29.6	275.1	48.9	8.1	6.3		84.8
1970	39.0	290.7	51.7	7.7	5.9		96.6
1971	38.1	278.8	49.6	7.3	5.5		93.2
1972	36.3	266.1	47.1	6.8	5.1		88.5
1973	35.3	250.0	44.0	6.5	4.8		84.1
1974	34.2	237.1	41.9	6.4	4.7		80.8
1975	32.7	228.2	40.2	6.3	4.6		77.5
1976	30.9	216.0	38.0	6.4	4.7		73.6
1977	29.5	208.9	36.8	6.0	4.4		70.6
1978	27.8	200.3	35.2	5.9	4.3		67.3
1979	27.1	194.9	34.3	5.7	4.1		65.5
Energy Information Administration Data							
1977	31.8	207.4	36.5	NA	NA		NA
1978	31.4	208.0	36.5	6.8	4.9		72.8
1979	29.8	201.0	35.4	6.6	4.8		70.0
1980	29.8	199.0	35.2	6.7	4.9		69.9
1981	29.4	201.7	35.7	7.1	5.2		70.3
1982	27.9	201.5	35.7	7.2	5.2		68.8
1983	27.7	200.2	35.6	7.9	5.7		69.0
1984	28.4	197.5	35.1	7.6	5.5		69.0
1985	28.4	193.4	34.4	7.9	5.6		68.5
1986	26.9	191.6	34.0	8.2	5.7		66.6
1987	27.3	187.2	33.3	8.1	5.8		66.3
1988	26.8	168.0	29.8	8.2	5.8		62.5
1989	26.5	167.1	29.7	7.8	5.5		61.7
1990	26.3	169.3	30.1	7.6	5.4		61.7
1991	24.7	167.1	29.7	7.5	5.3		59.6
1992	23.7	165.0	29.3	7.5	5.2		58.3
1993	23.0	162.4	28.8	7.2	5.1		56.8
1994	22.5	163.8	29.0	7.2	5.1		56.6
1995	22.4	165.1	29.2	7.4	5.3		56.9
1996	22.0	166.5	29.5	7.8	5.5		57.0
1997	22.5	167.2	29.6	8.0	5.6		57.7
1998	21.0	164.0	29.2	7.5	5.3		55.5

¹ The American Gas Association estimates of natural gas proved reserves include volumes of gas held in underground storage. In 1979, this volume amounted to 4.9 trillion cubic feet. Energy Information Administration (EIA) data do not include gas in underground storage.

² Crude oil equivalent. Natural gas and natural gas liquids are converted to Btu on the basis of annual average conversion factors. See Appendix A.

NA=Not available.

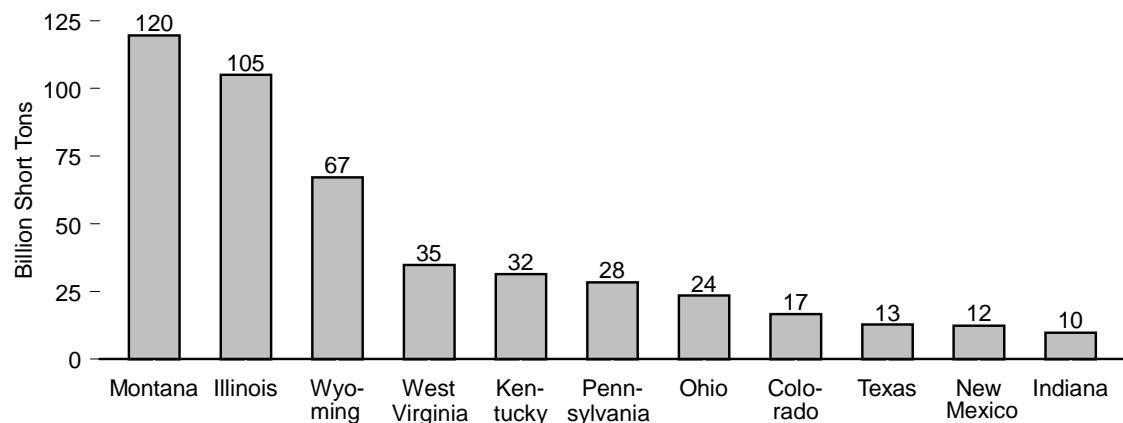
Note: Data are at end of year.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

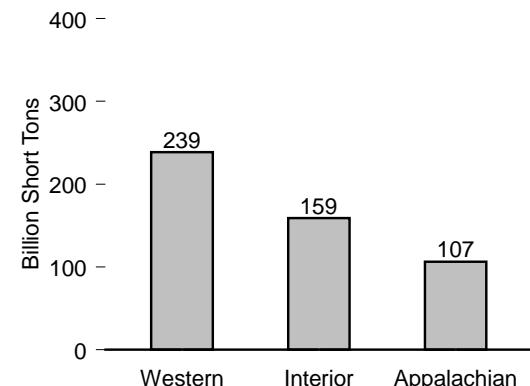
Sources: **API/AGA Data:** American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly). *Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the United States and Canada as of December 31, 1979*, Volume 34, June 1980. **EIA Data:** • 1977-1987—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports. • 1988 forward—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report 1998* (December 1999), Table 1.

Figure 4.11 Coal Demonstrated Reserve Base, January 1, 1999

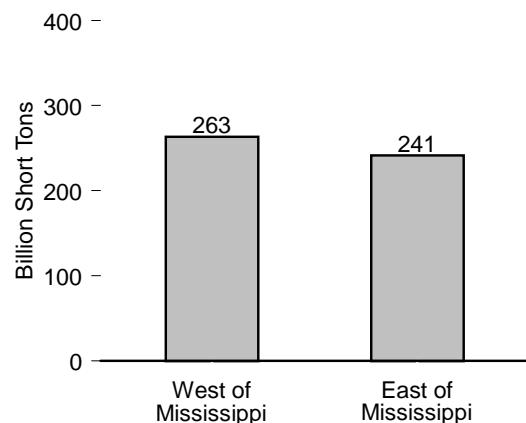
By Key State



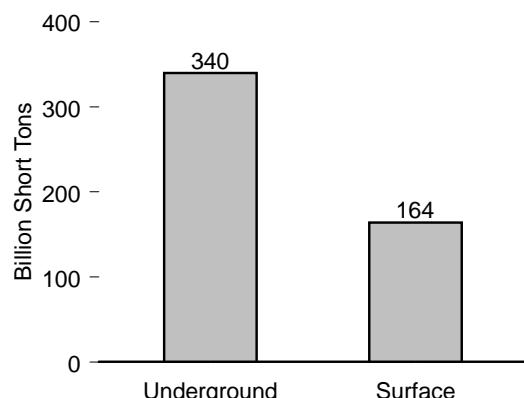
By Region



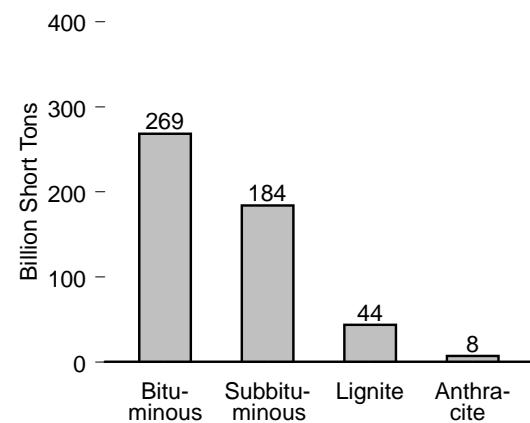
West and East of Mississippi



By Mining Method



By Rank



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 4.11.

Table 4.11 Coal Demonstrated Reserve Base, January 1, 1999

(Billion Short Tons)

Region and State	Anthracite	Bituminous Coal		Subbituminous Coal		Lignite	Total		
		Underground	Surface	Underground	Surface	Surface ¹	Underground	Surface	Total
Appalachian	7.3	74.0	24.0	0.0	0.0	1.1	78.0	28.5	106.5
Alabama	0.0	1.2	2.2	0.0	0.0	1.1	1.2	3.2	4.5
Kentucky, Eastern	0.0	2.0	9.7	0.0	0.0	0.0	2.0	9.7	11.7
Ohio	0.0	17.7	5.8	0.0	0.0	0.0	17.7	5.8	23.6
Pennsylvania	7.2	20.2	1.0	0.0	0.0	0.0	24.0	4.4	28.4
Virginia	0.1	1.3	0.7	0.0	0.0	0.0	1.4	0.7	2.1
West Virginia	0.0	30.5	4.3	0.0	0.0	0.0	30.5	4.3	34.8
Other ²	0.0	1.2	0.4	0.0	0.0	0.0	1.2	0.4	1.5
Interior	0.1	118.1	27.6	0.0	0.0	13.3	118.2	40.9	159.1
Illinois	0.0	88.3	16.6	0.0	0.0	0.0	88.3	16.6	104.9
Indiana	0.0	8.8	1.0	0.0	0.0	0.0	8.8	1.0	9.8
Iowa	0.0	1.7	0.5	0.0	0.0	0.0	1.7	0.5	2.2
Kentucky, Western	0.0	16.2	3.7	0.0	0.0	0.0	16.2	3.7	19.8
Missouri	0.0	1.5	4.5	0.0	0.0	0.0	1.5	4.5	6.0
Oklahoma	0.0	1.2	0.3	0.0	0.0	0.0	1.2	0.3	1.6
Texas	0.0	0.0	0.0	0.0	0.0	12.8	0.0	12.8	12.8
Other ³	0.1	0.3	1.1	0.0	0.0	0.5	0.4	1.6	2.0
Western	(s)	22.5	2.4	121.4	62.8	29.7	143.9	94.8	238.7
Alaska	0.0	0.6	0.1	4.8	0.6	(s)	5.4	0.7	6.1
Colorado	(s)	8.0	0.6	3.8	0.0	4.2	11.9	4.8	16.7
Montana	0.0	1.4	0.0	69.6	32.9	15.8	71.0	48.6	119.6
New Mexico	(s)	2.7	0.9	3.5	5.2	0.0	6.2	6.2	12.4
North Dakota	0.0	0.0	0.0	0.0	0.0	9.3	0.0	9.3	9.3
Utah	0.0	5.5	0.3	(s)	0.0	0.0	5.5	0.3	5.7
Washington	0.0	0.3	0.0	1.0	(s)	(s)	1.3	(s)	1.4
Wyoming	0.0	3.8	0.5	38.7	24.1	0.0	42.5	24.6	67.1
Other ⁴	0.0	0.1	0.0	(s)	(s)	0.4	0.1	0.4	0.5
U.S. Total	7.5	214.6	54.0	121.4	62.8	44.0	340.1	164.2	504.3
States East of the Mississippi River	7.3	187.5	45.3	0.0	0.0	1.1	191.5	49.7	241.2
States West of the Mississippi River	0.1	27.1	8.7	121.4	62.8	42.9	148.6	114.5	263.1

¹ Lignite resources are not mined underground in the United States.

² Georgia, Maryland, North Carolina, and Tennessee.

³ Arkansas, Kansas, Louisiana, and Michigan.

⁴ Arizona, Idaho, Oregon, and South Dakota.

(s)=Less than 0.05 billion short tons.

Notes: • See U.S. Coal Reserves: 1997 Update on the Web Page for a description of the methodology used to produce these data. • Data represent known measured and indicated coal resources meeting

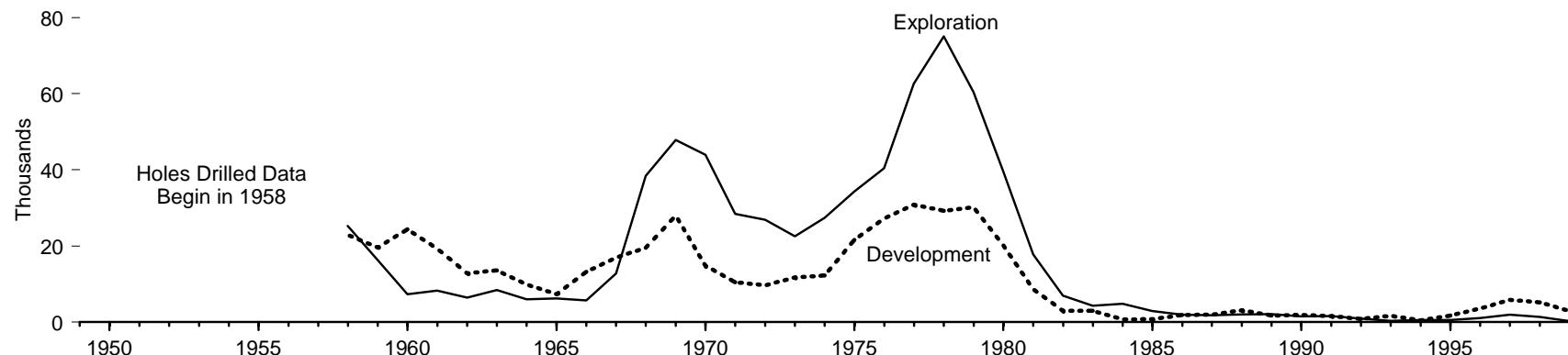
minimum seam and depth criteria, in the ground as of January 1, 1999. These coal resources are not totally recoverable. Net recoverability ranges from 0 percent to more than 90 percent. Fifty-four percent of the demonstrated reserve base of coal in the United States is estimated to be recoverable. • Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelcoal.html>.

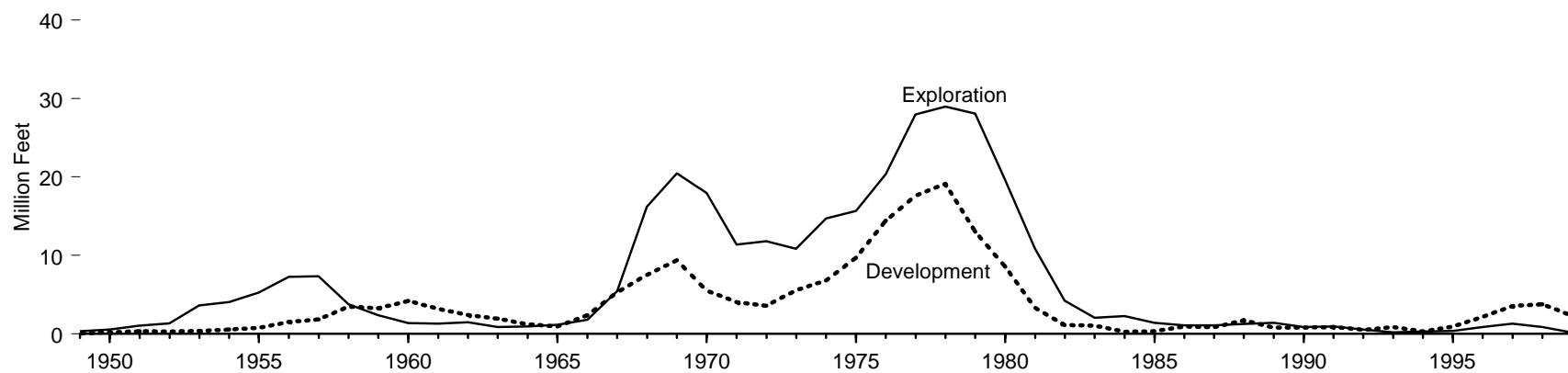
Source: Energy Information Administration, Coal Reserves Data Base.

Figure 4.12 Uranium Exploration and Development Drilling, 1949-1999

Holes Drilled



Footage Drilled



Source: Table 4.12.

Table 4.12 Uranium Exploration and Development Drilling, 1949-1999

Year	Exploration ¹		Development ²		Total	
	Holes Drilled (thousands)	Footage Drilled (million feet)	Holes Drilled (thousands)	Footage Drilled (million feet)	Holes Drilled (thousands)	Footage Drilled (million feet)
1949	NA	0.36	NA	0.05	NA	0.41
1950	NA	0.57	NA	0.21	NA	0.78
1951	NA	1.08	NA	0.35	NA	1.43
1952	NA	1.36	NA	0.30	NA	1.66
1953	NA	3.65	NA	0.37	NA	4.02
1954	NA	4.06	NA	0.55	NA	4.61
1955	NA	5.27	NA	0.76	NA	6.03
1956	NA	7.29	NA	1.50	NA	8.79
1957	NA	7.35	NA	1.85	NA	9.20
1958	25.32	3.76	22.93	3.49	48.25	7.25
1959	16.25	2.37	19.59	3.28	35.84	5.65
1960	7.34	1.40	24.40	4.21	31.73	5.61
1961	8.26	1.32	19.31	3.19	27.57	4.51
1962	6.44	1.48	12.87	2.43	19.31	3.91
1963	8.47	0.88	13.53	1.98	22.01	2.86
1964	5.97	0.97	9.91	1.25	15.88	2.21
1965	6.23	1.16	7.33	0.95	13.56	2.11
1966	5.75	1.80	13.18	2.40	18.93	4.20
1967	12.79	5.44	16.95	5.33	29.74	10.76
1968	38.47	16.23	19.53	7.53	58.00	23.75
1969	47.85	20.47	28.01	9.39	75.86	29.86
1970	43.98	17.98	14.87	5.55	58.85	23.53
1971	28.42	11.40	10.44	4.05	38.86	15.45
1972	26.91	11.82	9.71	3.61	36.62	15.42
1973	22.56	10.83	11.70	5.59	34.26	16.42
1974	27.40	14.72	12.30	6.84	39.70	21.56
1975	34.29	15.69	21.60	9.73	55.89	25.42
1976	40.41	20.36	27.23	14.44	67.64	34.80
1977	62.60	27.96	30.86	17.62	93.45	45.58
1978	75.07	28.95	29.29	19.15	104.35	48.10
1979	60.46	28.07	30.19	13.01	90.65	41.08
1980	39.61	19.60	20.19	8.59	59.80	28.19
1981	17.75	10.87	8.67	3.35	26.42	14.22
1982	6.97	4.23	3.00	1.13	9.97	5.36
1983	4.29	2.09	3.01	1.08	7.30	3.17
1984	4.80	2.26	0.72	0.29	5.52	2.55
1985	2.88	1.42	0.77	0.34	3.65	1.76
1986	1.99	1.10	1.85	0.97	3.83	2.07
1987	1.82	1.11	1.99	0.86	3.81	1.97
1988	2.03	1.28	3.18	1.73	5.21	3.01
1989	2.09	1.43	1.75	0.80	3.84	2.23
1990	1.51	0.87	1.91	0.81	3.42	1.68
1991	1.62	0.97	1.57	0.87	3.20	1.84
1992	0.94	0.56	0.83	0.50	1.77	1.06
1993	0.36	0.22	1.67	0.89	2.02	1.11
1994	0.52	0.34	0.48	0.32	1.00	0.66
1995	0.58	0.40	1.73	0.95	2.31	1.35
1996	1.12	0.88	3.58	2.16	4.70	3.05
1997	1.94	1.33	5.86	3.56	7.79	4.88
1998	1.37	0.89	5.23	3.75	6.60	4.64
1999	0.27	0.18	2.91	2.33	3.18	2.50

¹ Includes surface drilling in search of new ore deposits or extensions of known deposits and drilling at the location of a discovery up to the time the company decides sufficient ore reserves are present to justify commercial exploitation.

² Includes all surface drilling on an ore deposit to determine more precisely size, grade, and configuration subsequent to the time that commercial exploitation is deemed feasible.

NA=Not available.

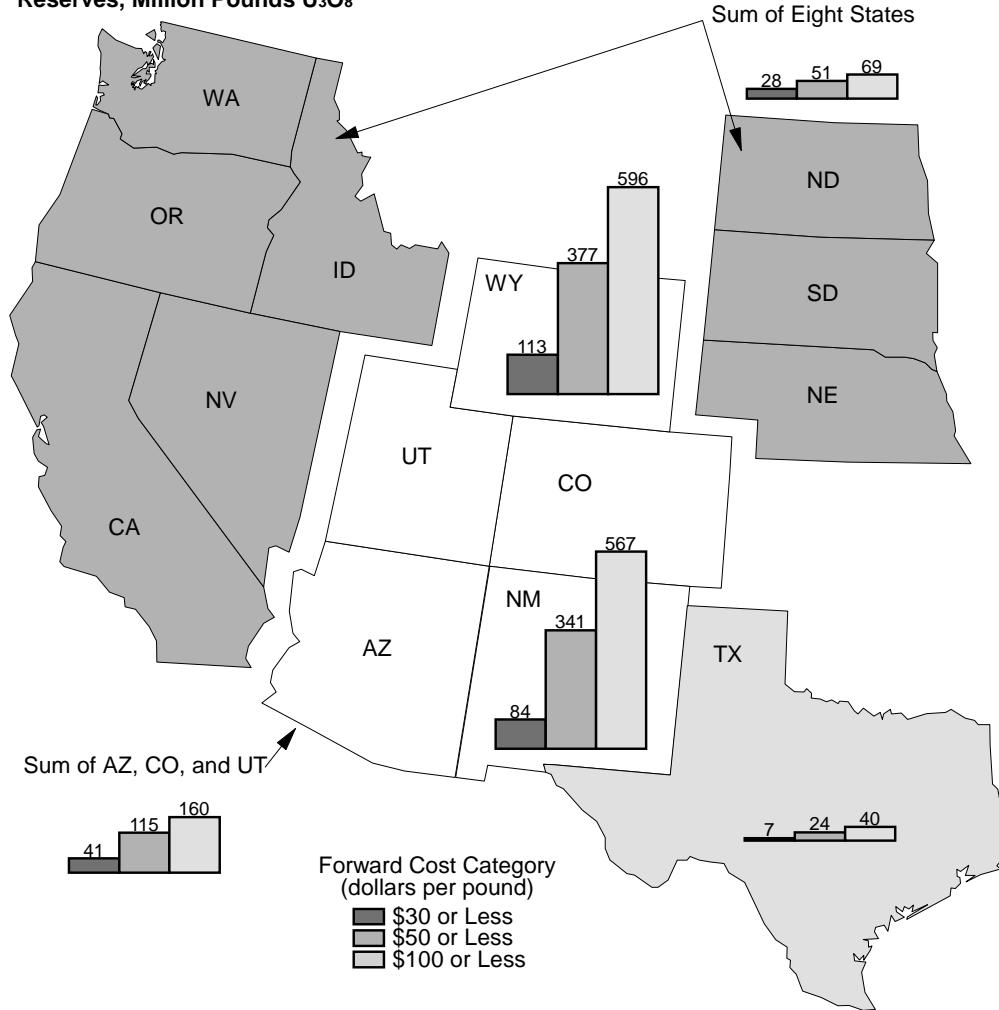
Note: Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelnuclear.html>.

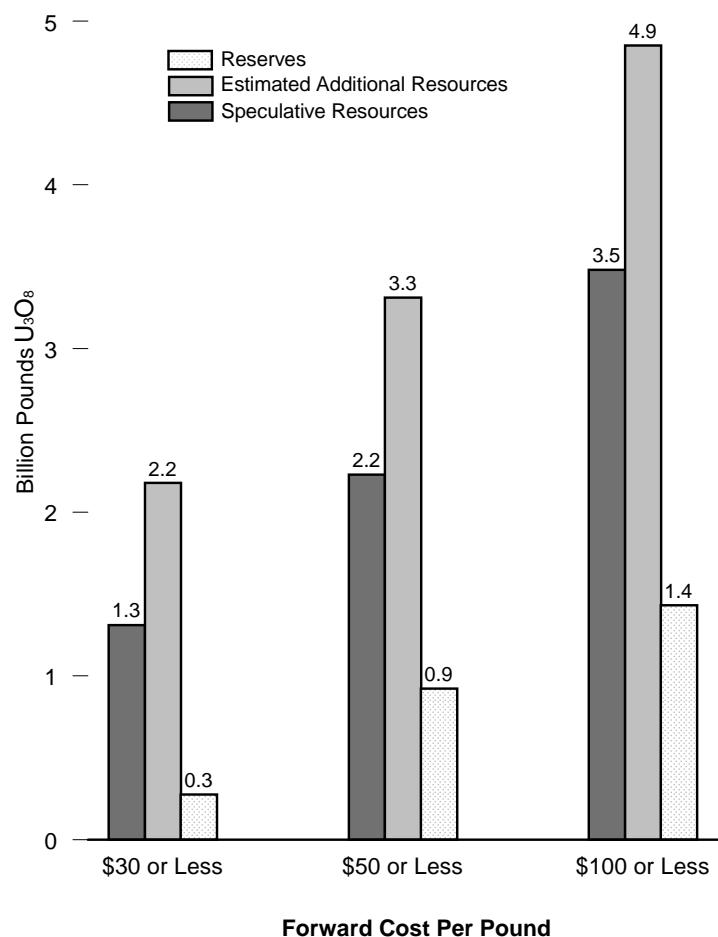
Sources: • 1949-1981—U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry*, January 1, 1983, Report No. GJO-100 (1983), Table VIII-5. • 1982-1989—Energy Information Administration (EIA), *Uranium Industry Annual*, annual reports. • 1990 forward—EIA, *Uranium Industry Annual* 1999 (May 2000), Table 1.

Figure 4.13 Uranium Reserves and Resources, 1999

Reserves, Million Pounds U₃O₈



Reserves and Resources



Notes: • Data are at end of year. • States shaded by group correspond to categories listed under "Reserves" on Table 4.13.

Source: Table 4.13.

Table 4.13 Uranium Reserves and Resources, 1999(Million Pounds U₃O₈)

Resource Category and State	Forward Cost Category (dollars per pound) ¹		
	\$30 or Less	\$50 or Less	\$100 or Less
Reserves²	274	908	1,432
New Mexico	84	341	567
Wyoming	113	377	596
Texas	7	24	40
Arizona, Colorado, Utah	41	115	160
Others ³	28	51	69
Potential Resources⁴			
Estimated Additional Resources	2,180	3,310	4,850
Speculative Resources	1,310	2,230	3,480

¹ Forward costs are all operating and capital costs (in current dollars) yet to be incurred in the production of uranium from estimated resources. Excluded are previous expenditures (such as exploration and land acquisitions), taxes, profit, and the cost of money. Generally, forward costs are lower than market prices. Resource values in forward-cost categories are cumulative; that is, the quantity at each level of forward-cost includes all reserves/resources at the lower cost in that category.

² The Energy Information Administration category of uranium reserves is equivalent to the internationally reported category of Reasonably Assured Resources (RAR).

³ California, Idaho, Nebraska, Nevada, North Dakota, Oregon, South Dakota, and Washington.

⁴ Shown are the mean values for the distribution of estimates for each forward-cost category, rounded to the nearest million pounds U₃O₈.

Note: Data are at end of year.

Web Page: <http://www.eia.doe.gov/fuelnuclear.html>.

Sources: • Forward Costs \$30 or Less or \$50 or Less—Energy Information Administration (EIA), *Uranium Industry Annual 1999* (May 2000), Tables B1 and B4. • Forward Costs \$100 or Less—EIA, Office of Coal, Nuclear, Electric and Alternate Fuels database as of December 31, 1999.

Energy Resources Notes

1. These volumes are the sum of the respective mean estimates in United States Geological Survey, *1995 National Assessment of United States Oil and Gas Resources*, Circular 1118 (Washington DC, 1995), pp. 2 and 17-19, for the onshore United States and jurisdiction offshore waters, and in Minerals Management Services, *An Assessment of the Undiscovered Hydrocarbon Potential of the Nation's Outer Continental Shelf*, OCS Report MMS 96-0034 (Washington DC, 1996), pp. 14 and 18, for the Federal jurisdiction offshore.

Conventionally reservoired deposits are discrete subsurface accumulations of crude oil or natural gas usually defined, controlled, or limited by hydrocarbon/water contacts. **Unconventionally reservoired deposits (continuous-type accumulations)** are geographically extensive subsurface accumulations of crude oil or natural gas that generally lack well-defined hydrocarbon/water contacts. Examples include coalbed methane, "tight gas," and auto-sourced oil- and gas-shale reservoirs. **Ultimate recovery appreciation (reserve growth)** is the volume by which the estimate of

total recovery from a known oil or gas reservoir or aggregation of such reservoirs is expected to increase during the time between discovery and permanent abandonment.

For purposes of comparison, the Potential Gas Committee, an industry-sponsored group of experts, biennially provides another geologically-based estimate of the Nation's natural gas resources. The latest mean estimate, published in "Potential Supply of Natural Gas in the United States," December 31, 1996, is 1,067 trillion cubic feet. This volume includes undiscovered conventionally reservoired deposits, expected ultimate recovery appreciation, coalbed methane, and tight gas where it is believed to be technically recoverable and marketable at reasonable costs.

2. For 1970 forward, annual well completions are estimated by EIA based on individual well reports submitted to the American Petroleum Institute (1970-1994) and to Petroleum Information/Dwights LLC (1995 forward). The as-received well completion data for recent years are incomplete due to delays in the reporting of wells drilled. EIA therefore statistically imputes the missing data to provided estimates of total well completions and footage where necessary.